

Wheaton Metro Station Area Pedestrian Safety Evaluation

Wheaton, Maryland

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TABLE OF CONTENTS

Executive Summary	p. 1
Background and Purpose	p. 7
a. The Issue	
b. Study Purpose	
c. Approach & Participation	
d. Pedestrian Safety Goals	
e. Participant Primary Interests and Responsibilities	
Pedestrian Needs in Suburban Activity Centers	p. 11
a. Pedestrian Safety	
b. Pedestrian Comfort	
c. Pedestrian Scale	
d. Connecting Destinations	
Summary Analysis of Wheaton CBD	p. 16
a. Transportation Setting Overview	
b. Major Highways	
i. Georgia Avenue	
ii. University Blvd	
iii. Veirs Mill Road	
c. Arterial Traffic Operations	
d. Local Circulation	
e. Transit Service	
i. Metrorail Service	
ii. Metrobus & Ride-on Bus Services	
f. Safety Record	
g. Road Maintenance & Traffic Management	
i. State Responsibilities	
ii. Local Responsibilities	
h. Buildings, Pedestrian Environment, and Zoning Codes	
i. Planning Guidance	
i. General Plans	
ii. Regional Transportation Plan	
iii. Wheaton Sector Plan	
j. Land Use Control	
i. Development Review	
ii. Traffic Analysis	
iii. Pedestrian Impact Analysis:	
1. Private Development	
2. Capital Projects	
iv. State Highway Access Permits	

- k. **Street Design Standards**
- l. **Transit Stop Location**
- m. **Transit Oriented Development**
- n. **Parking**
 - i. **System Design**
 - ii. **Parking Supply**
 - iii. **Parking Utilization**
 - iv. **Development & Management**
- o. **Coordinated Decision Making**
- p. **Public Participation**

Opportunities to Improve Pedestrian Environments **p. 39**

- a. **Pathways, Connections & Crossing Safety**
 - i. **Street Hierarchy**
 - ii. **Visual Gateways**
 - iii. **Connected Grid Network**
 - iv. **Intersection Spacing**
 - v. **Travel Lane and Median Width**
 - vi. **Intersection Corner Design**
 - vii. **Driveway Design**
 - viii. **Pedestrian Communication**
- b. **Transit Stop Location & Amenity**
 - i. **Bus Stops Location**
 - ii. **Shelter Design**
- c. **Vehicle Safety & Wayfinding**
 - i. **Structured Parking Access**
 - ii. **Wayfinding System**
- d. **The Walking Environment**
 - i. **Public Space**
 - ii. **Parking Access Design**
 - iii. **Streetscape**
 - iv. **Clear Path**

Recommendations **p. 53**

- a. **Administrative and Operating Procedures**
- b. **Plans and Guidelines**
- c. **Maintenance and Preservation**
- d. **Capital Projects**
- e. **Education & Enforcement**

References

- a. Resource Interviews and Meetings
- b. Wheaton Guiding Documents
- c. Technical Resources

Appendices

- a. Wheaton Inventory
- b. Operations Analysis
- c. Parking Supply Analysis
- d. Pedestrian Safety in Transit Zones Presentation
- e. Conceptual Roadway Improvements

Figures

Figure 1 Recommended Transportation Improvements	p. 41
Figure A Pedestrian Crashes & Intersection Pedestrian Volumes	p. 22
Figure B Transit Routes, Shelters & Stops	p. 13
Figure C Traffic Volumes & Intersection Operations	p. 17
Figure D Parking Supply	p. 34

EXECUTIVE SUMMARY

Study Background

Conflicts between vehicle traffic and pedestrian activity are on the rise throughout the State of Maryland, and particularly in the District 3 region of the Maryland Department of Transportation (MDOT)/ Maryland State Highway Administration (SHA) that includes both Montgomery and Prince George's Counties.

These pedestrian-vehicle conflicts have begun to emerge as the State's first- and second-generation suburbs—many of which were originally designed mainly for automobile access—are becoming more intensely developed and inhabited, and increasingly used by pedestrians. At the same time, arterial roads in these areas are struggling to accommodate ever-growing levels of motor vehicle travel.

In recent years, MDOT/SHA have started to examine a number of new approaches to better accommodate both vehicle traffic and pedestrian activity on its facilities, including application guidelines and policy for mid-block crossings and countdown pedestrian signals, and recommended criteria for bus stop placement. The State has greatly improved its understanding of and comfort with the tools available.

At the same time, the State has developed increasingly sophisticated approaches to make its rights-of-way safer for both drivers and pedestrians, with growing recognition that it can not achieve all of its pedestrian and traffic safety goals solely with the tools at its disposal. Many other entities influence achievement of these goals and must be brought to the table to identify and undertake the full suite of actions that can be implemented. Adding to elements available through MDOT and SHA, partners with implementing tools include local planning, public works, public safety, and transit agencies; redevelopment authorities; and citizen and business representatives, among others.

MDOT and SHA's practice to include a wide range of outside stakeholders to comment on, and contribute to its planning efforts is well-established. By contrast, including these same stakeholders in the development of a collaborative framework to a) identify mutually held pedestrian and traffic safety goals on both State and local facilities, and b) implement these goals collaboratively and contemporaneously, up to this point has been missing. The Wheaton Pedestrian and Traffic Safety Strategy represents MDOT's initial effort at establishing such an area-wide pedestrian and traffic safety vision and at developing planning approaches that comprehensively address the many factors that contribute to traffic and pedestrian conflicts.

Wheaton Background

The Wheaton setting was selected to "test-drive" because it emblemizes many of the pedestrian-traffic safety concerns emerging around the State. In addition, the Wheaton setting includes a number of local agencies with strong interest in, and ability to, contribute to the area-wide, collaborative planning approach contemplated by MDOT/SHA.

The Wheaton Central Business District (CBD) is currently experiencing a rapid transformation from an aging suburban center to a transit-oriented suburban activity center, with rapid increases in residential and commercial development and a sharp increase in demand for high-volume auto-access to Westfield mall. New residential development along major roadways in the area indicates a revival in market demand for urban settings and amenities, including a safe, walkable environment. At the same time, expansion plans for the Westfield Shopping Center have followed a more traditional suburban development model that emphasizes auto accessibility over transit and pedestrian accessibility.

The ongoing changes in Wheaton's development character are taking place at the same time that public sensitivity to pedestrian/vehicular conflicts is increasing in Washington, DC region as a whole, and in Wheaton in particular, and addressing pedestrian safety issues is of increasing importance to the Maryland Department of Transportation (MDOT)

Changes in Wheaton's character are also taking place in a context where no single entity has a comprehensive strategy for how to address all of the emerging conflicts between the CBD's growing residential pedestrian base and existing and near term retail traffic demand including.

In response to this need, the Wheaton Metro Station Area Pedestrian Safety Evaluation Project was undertaken to provide an area-wide approach, addressing responsibilities of the multiple entities involved in creating an improved pedestrian environment in Wheaton, and finding ways to improve the pedestrian environment while maintaining vehicle operations in the Wheaton CBD.

Study Overview

The Wheaton study convened professional staff from all State and local agencies with a role in traffic and pedestrian safety in the CBD, including staff from the County DPWT, County Police, and the Mid-County Services Center; WMATA; MNCPPC; SHA District 3 staff; and Westfield properties representatives; along with a citizens and business oversight group to identify and inventory key pedestrian safety and flow improvements throughout the CBD, and to prepare a series of recommendations for consideration by all of the agencies involved in this study.

Under the oversight of MDOT and the various stakeholders, a consultant team retained by MDOT:

- Reviewed guiding plans, pedestrian and urban design standards, and relevant technical documents;
- Inventoried pedestrian safety issues in the Wheaton CBD;
- Prepared concept designs of potential pedestrian and traffic safety improvements; and,
- Prepared near term forecasts of traffic and analysis of intersection function under alternative streetscape design scenarios.

Based on the technical analysis performed, the consultant team has identified a set of recommended improvements that are widely believed to be capable of creating a safer and more sustainable transportation system in the Wheaton CBD, and around which stakeholders can create a coordinated implementation process.

Recommendations

The recommendations presented in this report fall into two broad categories. First, the report recommends creating a comprehensive network of well-spaced, highly-visible pedestrian crossings of the major corridors that are linked to pathways that connect to and through development nodes within the CBD. This recommendation implies the need to improve safety at managed conflict points within the roadway, and requires a system of well-designed, clearly marked crossings, occurring at reasonable intervals along the roadway, highly visible to approaching traffic, and provided with adequate crossing time. It also implies that site design and layout of new development should extend logical pathways and reinforce the safest crossings of major roads.

The report also recommends reinforcing driver awareness of pedestrians and reducing vehicle speeds that typically prevail in traditionally suburban settings. This recommendation implies the need for clear urban

design guidance to increase pedestrian sidewalk activity and to enclose the street with strong building edges within the area and at the entry points. It also implies the need to include an organized system of orientation signage at the entry points and throughout the urban area to help unfamiliar users to navigate the street system.

Specific subcategories of recommendations are presented below, and a detailed matrix of Wheaton Pedestrian and Traffic Safety recommendations is presented as **Table ES-1**.

Changes to Street Sections

- Relocate Ennalls Avenue to intersect Georgia Avenue at Price Avenue and provide a signal at the new intersection to create an urban grid and increase connectivity across Georgia Avenue. A relocated Ennalls would permit a more controlled marked crossing, thereby reducing frequent mid-block crossings nearby.
- Redesign the Veirs Mill Road and Georgia Avenue intersection to provide a fully signalized intersection and a crosswalk opportunity across Georgia Avenue. Coordinating planned developer improvements with intersection improvements should be explored.
- Extend Ennalls Avenue into the mall ring road at the current access drive location and add a signal with pedestrian phasing. Queuing through the Ennalls signal on Veirs Mill Road may create some traffic impacts. However, this improvement is expected to bring needed control to an area of high pedestrian and vehicular conflict.
- Along Veirs Mill Road, ensure safe pedestrian paths and crossings through treatments to the sidewalk edge and shortening pedestrian crossing distances. Lifting parking restrictions has potential as an approach to accomplish these goals. The addition of curb extensions makes the street cross-section more functionally similar to that approved for Westfield's development proposal. It also would provide room for a wide outside lane for bicycle accommodation and the same number of through lanes in both directions.
- Design geometric improvements to University Boulevard intersections at the Westfield, Grandview Drive and Amhurst Avenue and on Georgia Avenue at Blueridge Avenue. Designs should reduce curb radii for right turning vehicles, improve vehicle sight distance of crossing pedestrians and reduce pedestrian crossing distances.

Use of Planning Tools

- Use sector plan update process to reflect changes in Wheaton's character since original 1990 plan adoption.
- Require that new building entrances align with marked and/or signalized pedestrian crossings
- Consider linking development approvals to developer support for area-serving pedestrian and traffic safety improvements.
- Reflect Ennalls Avenue relocation in sector plan update

Transit Facilities

- Montgomery County has created bus stop selection criteria that will be used on 500 new shelter placements in coming months. The criteria should emphasize pedestrian access, orienting stops to marked crossings and building entrances.

- Improvements to communicate system routes, paths to area destinations, and bus arrival and departure information should be made to improve use of the transit system. Better real time information made available at stops helps to increase user understanding of the bus schedule and availability of service.

Streetscape Design

- Regularly evaluate the results of executed design plans and change design guidance to reflect lessons learned and best practices. Streetscape techniques and design processes are evolving within most planning and transportation agencies, in response to greater interest in producing better pedestrian environments. While aesthetic considerations such as landscape islands in parking lots and adding street trees to the street edge dominated early designs, functional design that builds and maintains a set of comprehensive network connections are also important to a project's long-term success.
- Establish stronger oversight of design exceptions to Wheaton's streetscape standards to ensure that both public and private projects build a unified street system.

Parking

- Each quadrant created by major roads and containing major pedestrian generators should be accessible to off-street garage parking that does not require a major arterial crossing. The next public garage is expected to provide parking for the redevelopment of the WMATA bus transfer center somewhere within the Wheaton triangle. The current Marketplace parking lot should be redeveloped with ground level retail spaces to create a pedestrian spine along Grandview Drive and to reinforce pedestrian north and south movements within the triangle. Any significant new parking that is not handled directly on the WMATA site could occur in the area north of Ennalls Avenue.

State Access Permitting & Maintenance Projects

- Rather than relying solely on local plans for guidance, Maryland State Highway Administration should have its own set of guidelines to apply to state-funded and developer improvements. The guidance would present recommended options for the design of sidewalks, crosswalks, and right-turn lanes; and, operational possibilities for the spacing of driveways and intersections in urbanizing areas.
- Local planning that includes a systems view of the local area transportation network can provide important thinking early in the process of evaluating land use options. Planning and project development resources within SHA provide an important resource to bring about greater balance between transportation systems design and alternative land use options.

Organization of Report

The remainder of this report is organized as follows:

Chapter 2 presents the Project Background and Purpose. It presents the problem, project approach, pedestrian safety goals of the study, and the interests and responsibilities of participants.

Chapter 3 presents a discussion of the Issues for Pedestrian Needs in Suburban Activity Centers. It includes the concepts of pedestrian safety, comfort, scale and connectivity.

Chapter 4 presents a Summary Analysis of Wheaton CBD. It covers the CBD's land use and transportation context, local planning guidance and ongoing public involvement opportunities, road and traffic management, land use control, and parking, transit and street systems.

Chapter 5 presents Opportunities identified through this analysis to Improve the Pedestrian Environment generally and as applied in Wheaton.

Chapter 6 offers Recommendations to improve effectiveness of administrative and operating procedures, plans and guidelines, system maintenance and preservation, capital projects, and pedestrian safety education and enforcement activities.

Appendix A presents the Inventory of Pedestrian Conditions identified throughout the study including a community field survey on October 23, 2003.

Appendix B presents an Operations Analysis using simulation modeling tools to evaluate proposals in this study.

Appendix C presents a Parking Supply Analysis to determine location and provision issues for long-term parking supply management.

Appendix D is the Pedestrian Safety in Transit Zones Presentation prepared to discuss this study, its findings and opportunities.

Appendix E presents the Conceptual Roadway Improvements proposed for Wheaton CBD as a result of this analysis.

Goal	ES-1 Wheaton Metro Area Pedestrian Safety Strategy	Sector		Maryland Department of Transportation			Montgomery County										Washington Metropolitan Aera Transit Authority		Developer/ Property Owner
				State Highway Administration			Maryland National Capitol Park & Planning Commission		Department of Public Works & Transportation				Regional Services Center	Metrorail	Metrobus				
		Public	Private	Access Permits	D3 Traffic & Office of Traffic & Safety	D3 Special Projects & Community Design Division	Community-Based Planning	Development Review/ Transportation Planning	Operations Division: Traffic Engineering & Operations Section	Operations Division: Parking Operations Section	Capital Development Division	Transit Services Division	Wheaton Urban District	Joint Development/ Real Estate	Bus Operations (bus stop locations)				
	Recommendation/Strategy																		
	Administrative & Operating Procedures																		
1	Provide automatic pedestrian recall phasing at all traffic signals in Wheaton Triangle	x			Support				Lead										
	Plans & Guides																		
1	Continue pilot program for implementation of accessible pedestrian devices and other pedestrian treatments where appropriate. Treatments include adding pedestals for push buttons and pedestrian signal heads, reconstructing curb ramps, placing RTOR restrictions, modifying sign placements to improve visibility, and adding pedestrian activated crossing signs.	x			Support				Lead										
1	Update Wheaton Streetscape Guidelines to address directional orientation for crosswalk, clear zone, clear pathway, street furniture, buffer, trees on curbside of sidewalk, and be referenced in corresponding roadway design documents add section to address bus stop shelter location, design, area map & rider information & amenity.	x				Support			Support				Lead						
1	Update County Road Code and DPWT Design Standards to enhance pedestrian safety and establish standards for lane width, median width, curb radii, landscaping, bike lanes, street lighting, sidewalks specific to urban/transit areas	x			Support			Lead	Support		Support								
1	Provide Best Practices Guide for SHA planning, access and design processes to help define urban/transit environments and to establish specific standards for lane width, median width, pavement markings curb radii, landscaping, bike lanes, street lighting, sidewalk characteristics	x			Support	Lead		Support											
2	Update Wheaton Streetscape Guidelines to add section to address bus stop shelter location, design, area map & rider information & amenity.	x									Support	Lead		Support					
3	Implement street wayfinding plan for public parking facilities	x								Lead			Support						
4	Expand Pedestrian Impact Study Guidelines to enhance pedestrian circulation and safety. Address desire lines, generators, and shortest travel distances. Guidance for site plan review: building entrance, sidewalk width (6' min), vehicle conflicts, characteristics of adjacent roadway, building orientation and facade compatible with pedestrian environment	x		Support			Lead (?)	Support	Support							Support			
4	Update Wheaton Sector Plan to recognize importance of street level pedestrian elements, idincluding priority for gateway, connectivity and pedestrian amenity projects (connections, gateway, orientation, and amenity), to expand the urban district to include Westfield property, provide greater opportunity to use optional development method & encourage property upgrades, targetted redevelopment, etc., and reflect changes in travel demand related to metro access & updated census	x					Lead						Support	Support					
4	Orient new development of major sites to intersections and the Pedestrian Overpass on Viers Mill		x				Support	Support						Support		Lead			
	Maintenance & Preservation																		
1	Provide consistent & more visible crossing details including crosswalk markings at all intersections & in-sign pedestrian actuated lighting pilot	x			Support	Lead													
1	Install countdown timers for Georgia Avenue and Veirs Mill Road pedestrian crossings (continuation of DPWT's Pilot project)	x			Support				Lead										
1	Lift parking restrictions on westbound (northbound) Veirs Mill Road between Metro Access and Ennalls Avenue and install bulbouts at intersections	x			Lead	Support			Support	Support									
2	Relocate/upgrade bus stops and shelters	x									Support	Lead		Support					
	Capital Projects																		
1	Connect Veirs Mill Road to Westfield Shoppingtown Ring Road at Ennalls Avenue and install traffic signal	x	x	Support	Support		Support	Lead	Support				Support			Support			
1	Connect Grandview Avenue to Georgia Avenue at Price Avenue (Ennalls Relocated) and install traffic signal	x	x	Support	Support		Support	Support	Support	Support	Lead (If not private)		Support			Support			
1	Realign Veirs Mill Road approach to Georgia Avenue, modify traffic signal and install crosswalks through joint SHA's Crash Prevention Program and Westfield development improvements	x	x	Support	Support	Lead			Support				Support			Support			
	Education & Enforcement																		
1	Organize on-site friendly "sting" operations to change pedestrian and vehicle behavior	x			Support				Support				Lead						

BACKGROUND AND PURPOSE

The Issue

Decision-makers agree that pedestrian safety on Maryland's suburban arterials has become a significant concern in recent years. Heavily populated suburban centers that make up much of Central Maryland are increasingly mixing modes and changing their composition as new development is drawn to them. The Wheaton Metro Station area, Wheaton's Central Business District (CBD), is a good example. Located just beyond the Washington Beltway, its access to the region has made it a desirable residential location since the 1950s causing increased traffic congestion as development moved farther out. Like many 2nd generation suburbs its widest and busiest urban roadways, the arterial network, have become attractive as transit routes, helping to mitigate increased mobility demand. Adding transit has brought people on foot, not only to stops and stations, but to nearby businesses, creating new opportunities for more dynamic, successful business districts. With this success comes a new dilemma, a conflict between increasing demand for highway capacity and maximum pedestrian safety for area mobility and transit access. A challenge for both planners and engineers designing roads and surrounding land use, the conflict also burdens Maryland's overall transportation system operations.



New housing under construction on Georgia Avenue (MD 97) just south of the Wheaton Metrorail Station.

This study presents the case of Wheaton CBD to begin to resolve this inherent conflict, identifying decision points in state and local processes designed to address automobile access and mobility over pedestrian mobility and access concerns. It recognizes that planners and engineers in suburban Maryland have started to change their thinking and approach to bring about mixed-use multimodal places. As evidence of this changed thinking begins to appear in many plans, policies and regulations, stepping back to outline what is working and identifying the full range of actions needed to build a comprehensive balanced transportation system can help future design attract all users and bring about better places.

Study Purpose

The purpose of this study is twofold. First, the study is designed to produce a framework for actions by other communities and the Maryland Department of Transportation to improve pedestrian safety and comfort in areas of high transit use and commercial activity. It recognizes that changes in the land use pattern brought about by more intensive redevelopment can bring about greater efficiencies in the transportation system and a more dynamic economic environment than previous designs have done.



New housing under construction in Wheaton CBD.

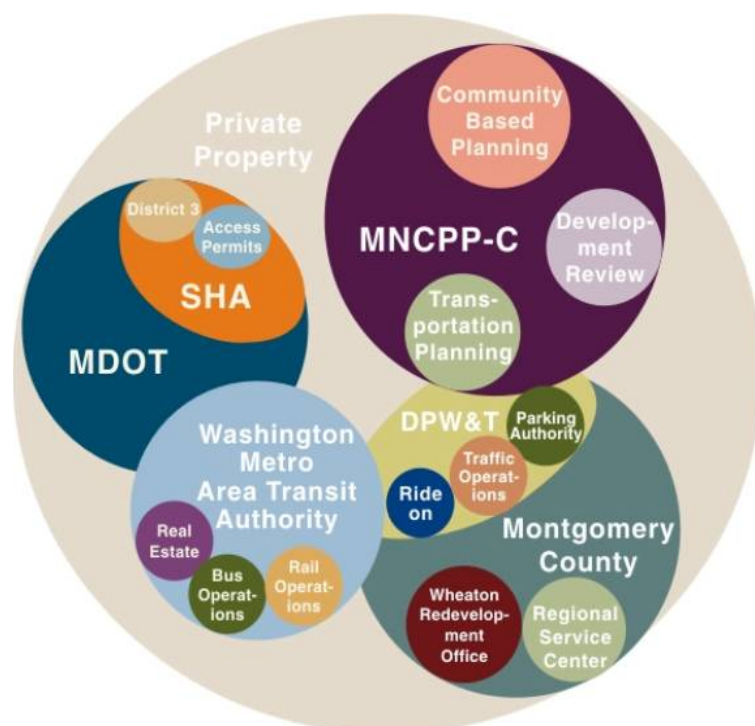
Wheaton's redevelopment is an example of this opportunity. Since the 1990 completion of the Washington Metrorail station at the crossroads of Georgia Avenue and Veirs Mill Road, new housing types and new households have been introduced into the CBD. The combination of public and private investment has helped to transform it from a suburban arterial crossroads to a center of transit route connections and pedestrian activity. Recovering the cost of these investments and paying for the day-to-day systems operation increases as the number of daily transit passengers at each station reaches capacity. Well-designed development in a dense land use pattern combined with multimodal transportation options can accommodate growth without substantial increases in highway demand, creating greater economies-of-scale for existing transportation facilities. Concepts illustrating this way of thinking emphasizes "moving people" rather than the more single mode focus emphasizing just cars, just buses, or just pedestrians.

The second purpose of this study responds to specific concerns expressed by the Wheaton community about pedestrian safety along the high-capacity roadways closest to the Metrorail Station, specifically, Georgia Avenue, University Boulevard, and Veirs Mill Road. Recognizing that these roads are part of a larger environment, the study investigates Wheaton's transformation through recent and near term development including related transportation improvements and the decision-making processes that will build Wheaton's future. This study is the first step in a dialogue to coordinate activities among public agencies, property owners and residents to advance decisions toward a unified vision for Wheaton's mixed-use transit environment.

Approach & Participation

To identify a range of broadly describable and technically feasible solutions to existing deficiencies, this study has aimed to build on the information and findings of related Wheaton area studies, whether concluded or still underway. From Wheaton's 1990 Sector Plan to several recent design charrettes, many efforts have been set in motion to mold the area into a safe, attractive, and economically successful place. Assembling this broad range of information was needed to support broad analysis and conclusions.

People involved in building a future Wheaton are many. They are guided by a variety of plans, standards, regulations, and motivations. As a crossroads community in a suburban environment, Wheaton's development framework spans multiple jurisdictions, and involves complex lines of responsibility between the



Wheaton's agency decision-makers, interrelated and overlapping responsibilities

agencies planning and delivering land use and transportation services. Effecting deliberate change to accomplish desired outcomes in communities like Wheaton requires vision, patience, in-depth knowledge of the planning process, and great skill at navigating the multi-jurisdictional regulatory waters.

Linking the decision-making framework to actual conditions and current development helped to determine the range of issues and engage permitting agencies and community representatives. Property owners, interested community members and agency representatives were brought together to share observations, concerns, and possible solutions. The Mid-County Services Center and the Wheaton Redevelopment Office invited participants and hosted meetings creating a Wheaton Study Advisory Group for the purposes of this study.

Participants in the Wheaton Study Advisory Group included transportation operations and parking authority staff of the Montgomery County Department of Public Works and Transportation (DPW&T), planning and transportation staff of the Maryland National Capital Park and Planning Commission of Montgomery County (MNCPPC), District 3 staff of the Maryland State Highway Administration (SHA), real estate and bus operations staff of the Washington Metro Area Transit Authority (WMATA), members of the Wheaton Urban District Advisory Committee (WUDAC), its Wheaton Redevelopment Urban Design and the Pedestrian Safety Steering Sub-Committees (WRSC) and the project manager for the Westfield Shoppingtown expansion. Because the issue of pedestrian safety in and around the Metrorail Station has been a documented and longstanding community concern, residents were a key resource to identify specific problem locations. Several meetings with community members, including an organized field walk, helped to paint a picture of their concerns. The full inventory of noted issues and opportunities is provided in the attached Appendix A. Agency officials and developers also participated in focused topic meetings.

Pedestrian Safety Goals

The Wheaton Study Advisory Group agreed on the following goals resulting from field observations made during the October 2003 Existing Conditions Inventory (Appendix A). Pedestrian safety goals were established to organize inventory observations and orient action items for agency follow-up. The goals, detailed below, were also used to evaluate recommendations to improve pedestrian safety described later in this report. They address roadway network design, transit infrastructure, systems operations and land use/urban design. They recognize that each of these system elements will help to produce a place that goes beyond simply accommodating existing pedestrian needs, but stimulates pedestrian activity as a catalyst to commercial success and community enjoyment of the CBD.

- **Support Logical Pathways, Connections & Pedestrian Crossing Safety**
- **Enhance Transit Stop Location & Amenity**
- **Improve Vehicle Safety & Wayfinding**
- **Strengthen the Walking Environment**



Street activity signals to drivers to anticipate pedestrians along their path and helps to enhance driver awareness.

Participant Primary Interests and Responsibilities

The following table summarizes the key concerns of individuals and principal responsibilities of agency representatives. Based on these goals, the study approach aims to identify solutions that could be reconciled with primary agency missions and private individual motivations.

Study Participants	Primary Interests & Responsibilities
Commercial Property Owners	<ul style="list-style-type: none"> Return on financial investment in properties Convenient access Ample parking
Community Members: Wheaton Urban District Advisory Committee, Wheaton Redevelopment Steering Committee and subcommittees	<ul style="list-style-type: none"> Safe pedestrian access to transit & business areas Less traffic and congestion Private developer investment in transportation infrastructure
Mid-County Services Center	<ul style="list-style-type: none"> Act on behalf of the County Executive to address community concerns for a safer and more attractive downtown Wheaton
Wheaton Redevelopment Office	<ul style="list-style-type: none"> Encourage private investment in Wheaton properties Facilitate project development through coordinated public agency and community communication
Washington Metro Area Transit Authority	<ul style="list-style-type: none"> Increase riders of its Metrorail and regional bus services Advance development of station areas with increased density attractive to transit patrons Maintain parking and station areas serving transit patrons Equal access to all patrons (ADA)
Montgomery County Department of Public Works	<ul style="list-style-type: none"> Optimize operating efficiency of existing roadway network through signal timing Plan, design and construct improvements to County facilities including the County roadway network Provide public parking facilities for commercial success of the Wheaton Urban District Operate Ride-on local service Install and maintain County transit shelters used by all providers
Maryland National Capital Park & Planning Commission: Montgomery County	<ul style="list-style-type: none"> Plan for development to maintain quality of life standards for Montgomery County residents and businesses Process development proposals to meet County regulations, standards and guidelines
Maryland State Highway Administration	<ul style="list-style-type: none"> Maintain regional highway safety and mobility Minimize access impacts to safety and mobility of state facilities Plan, design and execute projects to improve highway capacity, operations, safety and efficiency
Maryland Department of Transportation	<ul style="list-style-type: none"> Develop State Consolidated Transportation Plan for transportation capital and operating budgets Optimize state transportation investments promoting mode choice, reduces taxpayer costs, & increases system efficiency and safety

PEDESTRIAN NEEDS IN SUBURBAN ACTIVITY CENTERS

The most economically successful and safe pedestrian commercial environments are a complex balance of pedestrian facilities, mix of uses, and activity generators woven together in a tight urban fabric that make walking both comfortable and interesting. These places are typically characterized with transportation terms: Main Streets, and in grander scale, Boulevards. The terms themselves, after a long absence from the official vocabulary of the professional planner, traffic engineer and developer, are beginning to make a comeback. They are especially useful when imagining the transformation of communities like Wheaton. They refer to a balance of users in the transportation system. The patterns required for pedestrians and the systems needed for efficient transit and bicycling become overlaid on the roadway network. This layering of systems suggests a need for balance that may require efficiency tradeoffs including higher levels of traffic congestion in exchange for greater pedestrian safety and transit desirability. The unreliability of the congested roadway may even promote use of transit for greater scheduling certainty.

The scale and character of roads and the built environment effecting pedestrian safety is generally determined long before permitting approvals of construction projects. Safety Conscious Planning (SCP), emerging within the transportation field, promotes safety as an explicit consideration in land use planning. It recommends evaluating land use and transportation infrastructure relationships early and thoughtfully to avoid building a safety problem that must be mitigated in the future. Mixed mode safety requires consideration of the differential speeds and resulting traffic friction as well as increased vulnerability due to size differences (Safety Conscious Planning: The Development of the Safer Transportation Network Planning Process, Kelvin Roberts, Jan 2001).

Pedestrian Safety System Basics

- Continuous & connected paths
- Adequate sidewalk width
- Protection from moving vehicles
- Well-lit and delineated sidewalks and crosswalks
- Balanced accommodation of pedestrian and vehicle movements at intersections

Elements that work together to create a safe, desirable, and appropriately sized pedestrian environment are described below as system, comfort, scale, and connectivity.

Pedestrian System

The Institute of Transportation Engineers' (ITE) Design and Safety of Pedestrian Facilities discusses the elements of a safe pedestrian environment. Most important is the presence of a clearly defined and continuous system. Adequate sidewalk width, protection from moving vehicles, well-lit and delineated sidewalks and crosswalks, and the balanced accommodation of pedestrian and vehicle movements at intersections all contribute to pedestrian safety. As every transit trip includes at least one pedestrian trip, these elements are especially important at station locations of high-capacity transit systems. The perception of safety is enhanced when stops are

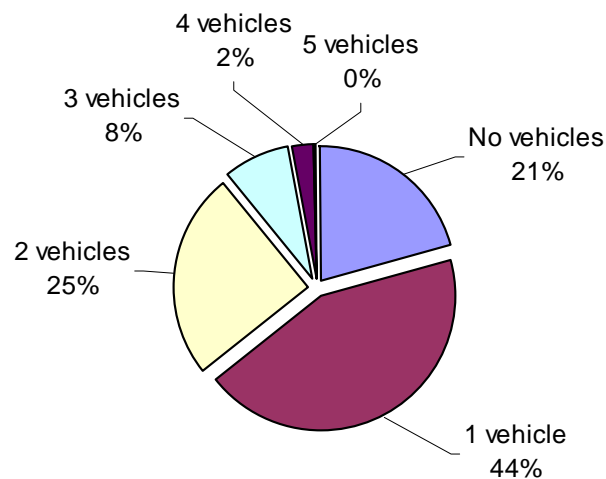


One of several mid-block crossing locations along Georgia Avenue in Wheaton. It is a direct connection to a long term parking garage through the Safeway parking lot from the Marketplace Triangle.

accessible, clean, attractive, secure, and comfortable.

Many households seek communities with good transit access. Regardless of the size and scale of the roadways and the character of traffic, residents of these transit-accessible suburban hubs will use the network much like they would in a small town. They travel on foot from shopping to home to school and to work. In Wheaton, key links between uses require crossing a 4-6-lane highway with vehicles moving at 35 mph to 50 mph. Widely spaced intersections are busy traffic nodes, managed through complex signal plans, and vehicles turn into the pedestrian path from left-turn storage lanes and a plethora of parking access points. In Montgomery County alone, 57 pedestrians died and 1524 were injured along roadways between 1997 and 2001 (Source: Montgomery County Blue Ribbon Panel on Pedestrian and Traffic Safety, Jan 2002).

Census Tract 7032.09



Household vehicle ownership for the area northeast of the Wheaton Metro Station. (Census Tract 7032.09)

The 2000 census in the Wheaton area reflects a trend of attracting transit-reliant households. Census tracts 7032.09 and 7038 report that 21% of households within this area operate without an automobile. Adding these households to those reporting only one vehicle, about two thirds of the households in close proximity to Downtown Wheaton own one car or less. The average number of vehicles per household in census tract 7032.09 is 1.3, well below the County average of 1.7 automobiles per household.

Pedestrian Comfort

A central principle of urban design is the need for a combination of “comfort” elements to help pedestrians feel safe. According to this principle, the sidewalk should provide feelings of enclosure and security. Windows and doors from buildings that front directly on the path give the pedestrian the feeling that they are not alone in the space, that there are “eyes” on the street. This is particularly important in a commercial area where blank walls, parking lots, and vacant properties can create “dead spaces” on the street. A variety of uses with parking and use peaks matched to maximize activity throughout the day and recycle parking spaces increases pedestrian appeal. During the community walk, participants identified Veirs Mill Road and University Boulevard as especially uncomfortable to



Key elements organized to create a classic urban sidewalk in one of Portland, Oregon's most popular new neighborhoods.

pedestrians citing some of these elements, and validating professional standards with their own voices.

Shade through the use of awnings and street trees can create a street environment conducive to both comfort and definition of the various functional spaces. Planters along the building edge provide a sense that someone is caring for the space and sends a subtle security signal to passing pedestrians. Supporting amenities such as seating and lighting further enhance this experience.

On-street parking, landscaping and street furniture buffers are typical elements used to separate pedestrian spaces from traffic, particularly as volume, speed and noise increase. Organizing a clear path in straight lines and 90-degree intersection angles can also help to orient the pedestrian to safe roadway crossing locations.

Finally, well-placed inviting open spaces oriented to the street have the ability to create outdoor living rooms and gathering spaces in walkable places. Well-designed transit stops can also contribute to the civic realm and create a positive image of transit services. The combination of these details can attract pedestrians, promote transit use, and create new business opportunities.

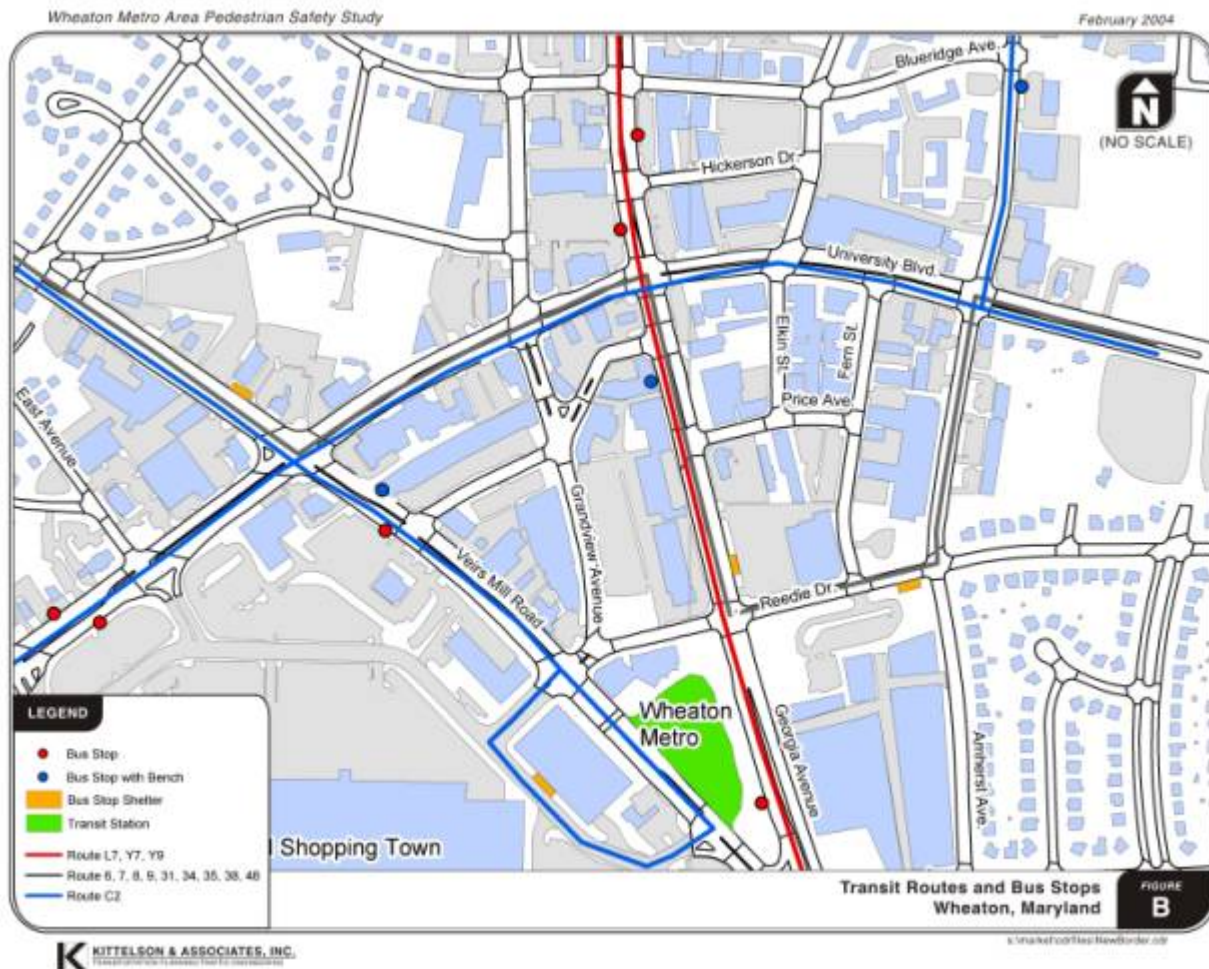


Figure B – Downtown Wheaton transit routes, bus shelters, and bus stops.

Pedestrian Scale

According to research conducted for the Federal Highway Administration (FHWA) by Charlie Zeeger of the Highway Safety Research Center, the typical non-recreational pedestrian trip is just under half a mile. To stay within a tolerable walking range in a suburban environment, where development is built with longer distances between destinations, pedestrians may shortcut the safest route. Increasing use by pedestrians of the safest routes has the greatest chance to succeed when safe pedestrian behavior is reinforced and rewarded with the following elements:

- Building the network to shorten walking routes to a pedestrian scale with more frequent crossings and connections between uses,
- Placing entry points of high demand pedestrian generators along pedestrian paths rather than through parking fields,
- Designing intersections with minimal pedestrian crossing distances, and,
- Timing traffic signals with short cycle lengths.

The poor pedestrian environment in Wheaton has produced many cut-through locations. The Georgia Avenue Safeway parking lot and the building gap next to the Magic Shop are two well-worn community pathways. These informal links match a frequent unmarked midblock pedestrian crossing and are evidence that a more formal pedestrian scale network system is needed.

Signal spacing at the major highways scale, with signalized crossings no less than 800 to 1000 feet also reduces pedestrian convenience. Coupled with the mid-block location of many bus stops, and infrequent bus headways, crossing mid-block in an unsafe manner by some pedestrians is nearly guaranteed.

Connecting Destinations

Creating walkable distances that reduce the need for pedestrians to use larger order roads requires consideration at each stage of planning in arterial corridor development. The following location and design examples present opportunities to orient pedestrian generator access to reinforce safe crossing behavior.

- Transit stops and building entrances related to marked or controlled intersections.
- Shared or public parking provided proximate to destination entry points.
- Site selection for a civic or community use that considers the origin of users and their access options.



Mid-block bus stop location on University Boulevard in front of the new Giant Food Store parking lot.

Planning and design of improvements near and around the Wheaton Metro Station must ultimately overcome the division created by Georgia Avenue and Veirs Mill Road for access between the station entrance and Metrobus transfer center in the triangle quadrant, and existing structured parking and feeder bus drop-offs across the street. Today's development pattern favors at-grade road crossings, perceived as more secure and direct, than the available grade-separated connections.



A popular walking route crosses Veirs Mill Road (center) from the Wheaton metro triangle (right) along a sidewalk next to Metro's parking garage to a busy Ride-on bus stop and the Westfield Shoppingtown mall (left).

SUMMARY ANALYSIS OF DOWNTOWN WHEATON

The pedestrian environment is affected by many elements of the built environment and the various agencies whose processes influence physical outcomes. This chapter begins with a discussion of the Wheaton's pedestrian environment and transportation system elements, roads and transit, and then describes agencies and processes, identifies shortcomings in the way pedestrian environment is handled and issues that need to be addressed in the future.

Transportation Setting Overview

Wheaton, like many 1st and 2nd generation suburban centers, finds that many of its most challenging pedestrian issues are related to its location at a major crossroads. The three regional roads that define Wheaton were created to carry large volumes of traffic to and through the area. This post-1950 physical design, anticipating the private automobile as the primary transportation mode for both short and long trips, is challenging to reconcile with a workable pedestrian scale. Unlike walkable development patterns, built on an interconnected grid, the overall transportation system in Wheaton (shown below) is based on a hierarchy of arterials, collectors and local streets that intersect at acute and oblique angles and create circuitous routes between uses and from neighborhoods into the CBD.

The suburban center roadway network, built to handle large peak hour volumes, was also designed to discourage pedestrian use with large intersections and few connections to lower order streets to reduce the number of conflict points and preserve highway capacity. In some communities, the scale and lack of mitigating congestion of these commuter routes contributes to off-peak speeding.

The transit system, designed to ease growing suburban commute traffic, has placed its stations and stops along these routes in more recent years. Arterial locations of commuter rail stations in suburban centers improve access and the interface between vehicular modes by supporting bus transfers and park-and-ride opportunities for patrons, but create more acute access issues for pedestrians.

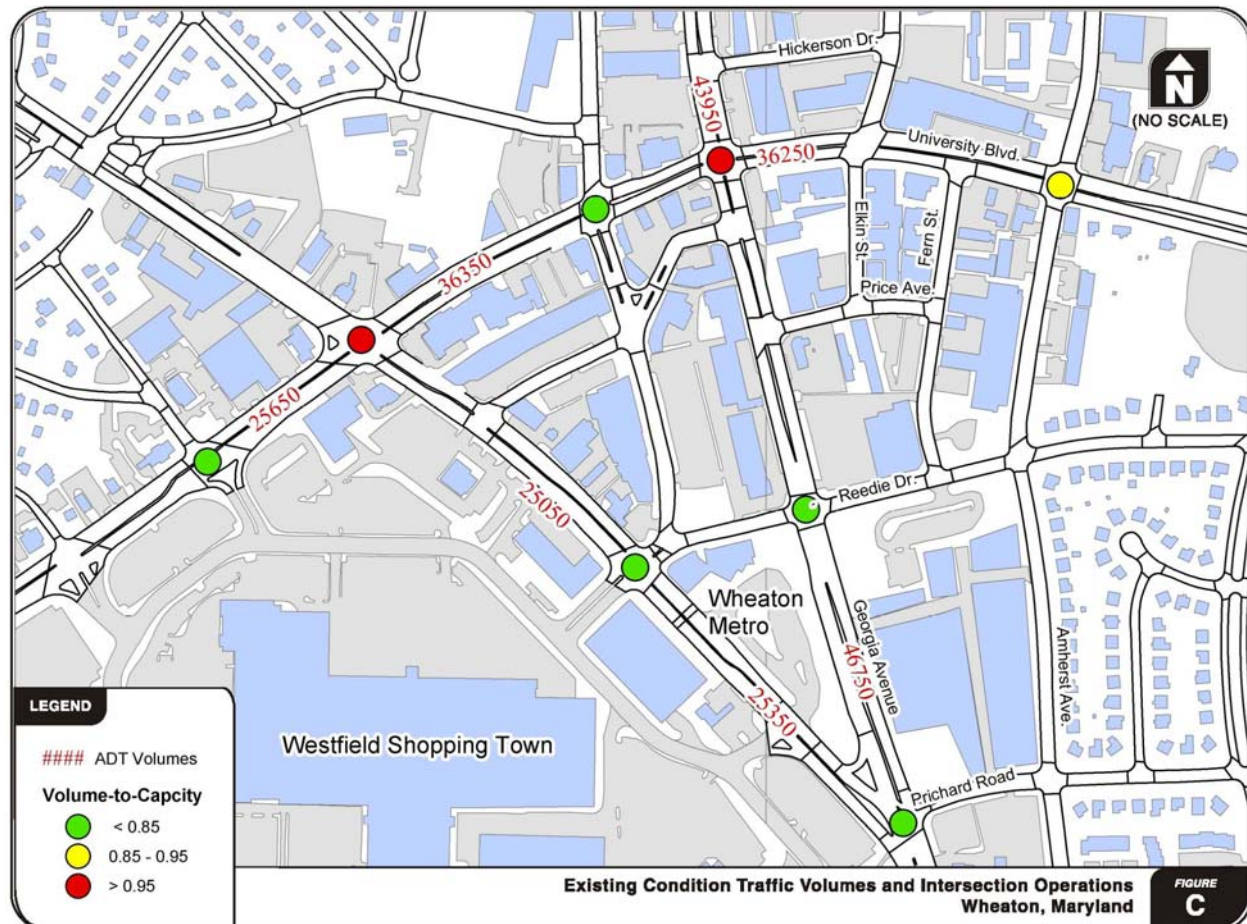
The following sections detail specific physical, operating, and safety characteristics of the street network and related transit services in the Wheaton CBD.



Aerial map showing 1/4 mile & 1/2 mile rings around the Wheaton Metrorail Station with sidewalk and ADA coverage verified in field surveys. Blue shows existing ADA compatible sidewalk available. Source: SHA/MTA Access 2000

Major Highways

Three major highways intersect to create the Wheaton Triangle. They are Georgia Avenue (MD 97), Veirs Mill Road (MD 586), and University Boulevard (MD 193). While Maryland SHA has jurisdiction over these region-serving roads, Montgomery County Department of Public Works and Transportation operates and maintains all traffic signals by agreement with SHA.



State highway signalized intersections average daily traffic and level of service for Downtown Wheaton. Source: SHA Traffic Management System

Georgia Avenue

Georgia Avenue runs north south and is the highest volume roadway in the Wheaton area, carrying over 45,000 vehicles per day north of Veirs Mill Road. Georgia Avenue is a six-lane divided highway with left-turn lanes at every signalized intersection and a 35 mile-per-hour posted speed. The left-turn lanes on Georgia Avenue at Reedie Drive are 8 feet wide. They were added to separate left-turn movements from through traffic within a constrained cross section.

Through Wheaton, Georgia Avenue maintains a fairly consistent section with few driveways compared to similar roads in the state system. The area is targeted for sidewalk reconstruction and those completed are beginning to change the appearance of the area. Building setbacks vary and transit stops are active.

University Boulevard

University Boulevard is similar to Georgia Avenue, also six-lanes wide and running in an east-west direction. It carries over 35,000 vehicles per day and has a posted speed of 35 miles per hour. During peak periods, parking is restricted in the outside lanes to allow three lanes of traffic in each direction. Parking is allowed in the outside lane during the remainder of the weekday and on weekends.

A section of University Boulevard was rebuilt recently as part of the Westfield Shoppingtown redevelopment adding a Giant Food Store and several commercial buildings. New sidewalks built as part of the project are 5 feet wide with a grass buffer and rebuilt intersections are well marked. While the roadway edge is commercially developed, the road serves many residential neighborhoods and pedestrian crossing safety is a frequent issue. All intersections and access drives along University Boulevard have generous turning radii and the pedestrian is offered few amenities.



Reconstructed sidewalk north of the Safeway parking lot is generous and has changed the pedestrian environment along Georgia Avenue.

Veirs Mill Road

Veirs Mill Road starts at Georgia Avenue and runs northwest towards Rockville carrying over 25,000 vehicles per day. It has two northbound lanes just north of Georgia Avenue. North of the Metro traffic signal, Veirs Mill Road then widens to allow a third through lane during peak periods and a parking lane during non-peak periods. Veirs Mill Road currently has three lanes in the southbound direction between University Boulevard and Georgia Avenue. The roadway then narrows back down to two lanes in each direction north of University Boulevard. The roadway is an important link between two major pedestrian generators, the Metrorail Station and Westfield Shoppingtown, and residential neighborhoods surrounding them.

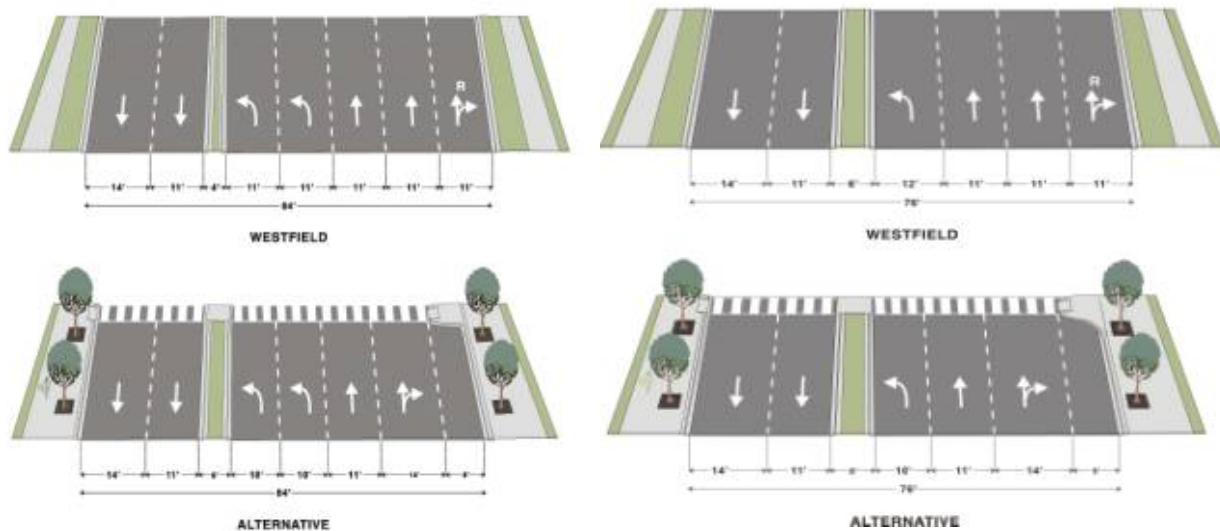


Veirs Mill Road looking south toward Georgia Avenue

Westfield Shoppingtown has proposed improvements Veirs Mill Road to create double lefts at its main entrances and reducing from 3 to 2 the number of southbound lanes including a 14-foot shared lane in the southbound direction to accommodate bicyclists. The operations analysis conducted as part of this study (Appendix B) evaluates an alternative that creates northbound parity. Changes are recommended that would begin to create a more urban street, improving the Georgia Avenue and Ennalls intersections where pedestrian crossings are unmarked and unsignalized today. Cross-sections of the proposed ideas are shown in the figures below.



Veirs Mill Road looking northbound at the Reedie Drive intersection/Westfield Shoppingtown entrance (left). Westfield has proposed dual lefts into its site using the southbound through lane. Testing this alternative for the southbound direction, reducing though lanes from 3 to 2 was included in this study as a pedestrian enhancement. The diagrams below shows the Westfield proposal and study recommended options for Reedie Drive (below left) and Ennalls Avenue (below right).



Arterial Traffic Operations

Traffic operations were evaluated at the signalized intersections in the Wheaton Triangle during the weekday a.m. and p.m. peak hours. A review of the intersection volumes shows that they are highest in the southbound direction (towards Washington D.C.) in the morning peak hour and in the northbound direction in the p.m. peak hour.

Figure C on Page 17 identifies average daily traffic volumes for the State Highways in the Wheaton Metro area and identifies peak hour intersection operations. As shown in the figure, the University Boulevard/Veirs Mill Road intersection is operating at capacity. All other signalized intersections are operating below capacity. Appendix B provides a detailed summary of the traffic operations analysis conducted under existing and future conditions. The Appendix includes an analysis of traffic operations impacts associated with the recommended pedestrian system improvements described later in this report. The pedestrian system improvements can be implemented and still meet Montgomery County's congestion standard for intersections within the Wheaton CBD.

Local Circulation

Grandview Avenue, Ennalls Avenue and Reddie Drive are Retail District streets that provide access to businesses and parking within the Wheaton Triangle from the surrounding highways and neighborhoods. The network of local streets that bisect and run parallel to the major highways outside of the Triangle are Blueridge Avenue, Hickerson Road, Price Avenue and Prichard Road running east-west and Elkin Avenue and Amhurst Avenue running north-south. All are maintained by Montgomery County Department of Public Works with 10 to 12 foot lane widths, residential scale sidewalk and one through lane in each direction. Guidance for improvements is found in DPWT Design Standards.

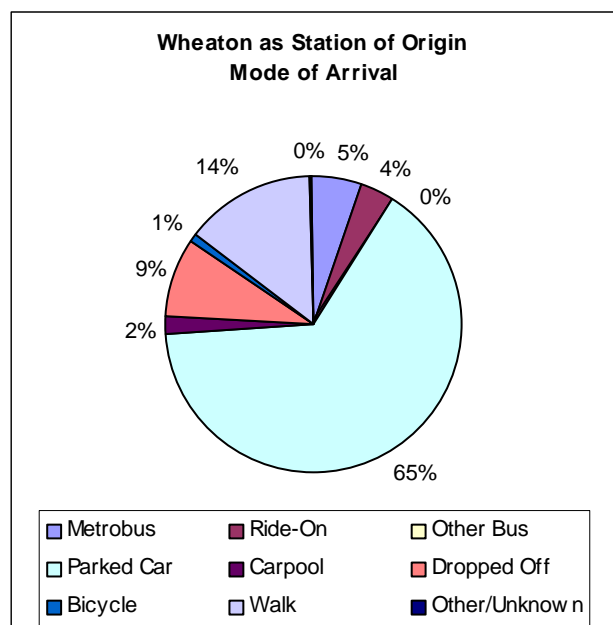
Westfield's Ring Road also functions like a local street for pedestrian traffic. Looking at the diagram on page 17, these streets connect well to the larger roads, however, there are frequent gaps in what begins to look much like a grid.

Transit Service

Metrorail Service

Wheaton Metro Station serves an average of 9300 rail passengers daily. According to recent WMATA passenger surveys, Wheaton was a destination for 200 out of 2685 Wheaton Station user respondents. Of that number, over half (52%) walked from the station to their destination. Of the 2495 respondents whose transit trip originates in Wheaton, 14.3% walk and 65% are parking near the station confirming the perception of high pedestrian demand for station access.

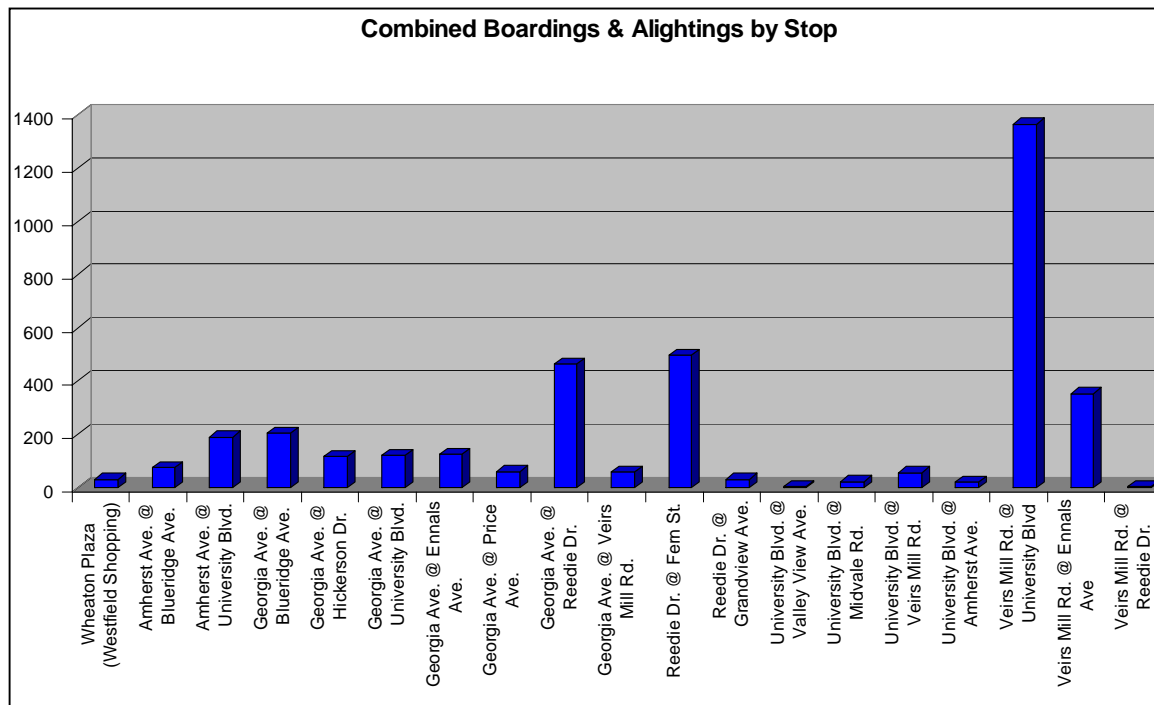
The station is bounded by Reddie Drive and is effectively traversed by Georgia Avenue and Veirs Mill Road. As both of these state roads are carrying 6 through lanes, WMATA has made considerable investment in grade-separated crossings from parking and near-in generators, such as the Westfield Shoppingtown mall. Field observations and pedestrian crossing data confirm that large numbers of pedestrians prefer to cross at grade. While these roads will continue to carry large peak hour volumes, requiring a wide roadway, visual cues to drivers including a building orientation in the vicinity of the station, will help to direct pedestrians and improve driving behavior.



Source: Montgomery County DPWT and WMATA

Metrobus and Ride-on Bus Services

Comprehensive bus service in urban areas usually includes local service, circulating between nearby residential areas and core destinations within the area, and regional access from points both within and beyond the CBD. In Wheaton, regional bus service is provided by WMATA Metrobus and local service is available from Montgomery County DPWT's Ride-On bus. Total daily bus boardings in Wheaton CBD are 2788 with about 1000 at the Wheaton Station. Total bus boardings and alightings in the Wheaton CBD, shown in the graph below, are nearly 5800 daily with approximately 34% occurring at the Metro Station.



Combined daily bus boardings and alightings for Metrobus and Ride-on service at stops in Wheaton CBD.
Source: Montgomery County

Figure B on page 13 shows 13 bus transit routes serving the Wheaton area on three Downtown paths. It also shows bus stop and shelter locations provided within the study area. Bus stop placement within Wheaton's busy roadway network present a major safety challenge and is perhaps one of the most important pedestrian safety issues of the area. While significant service exists, Wheaton is a typical suburban location with average peak hour headways of 30 minutes for Ride On and 8 to 30 minutes on Metrobus.



Bus passengers alighting from southbound Veirs Mill Road cross mid-block, avoiding the unmarked Ennalls Ave and the busy University Blvd intersections.

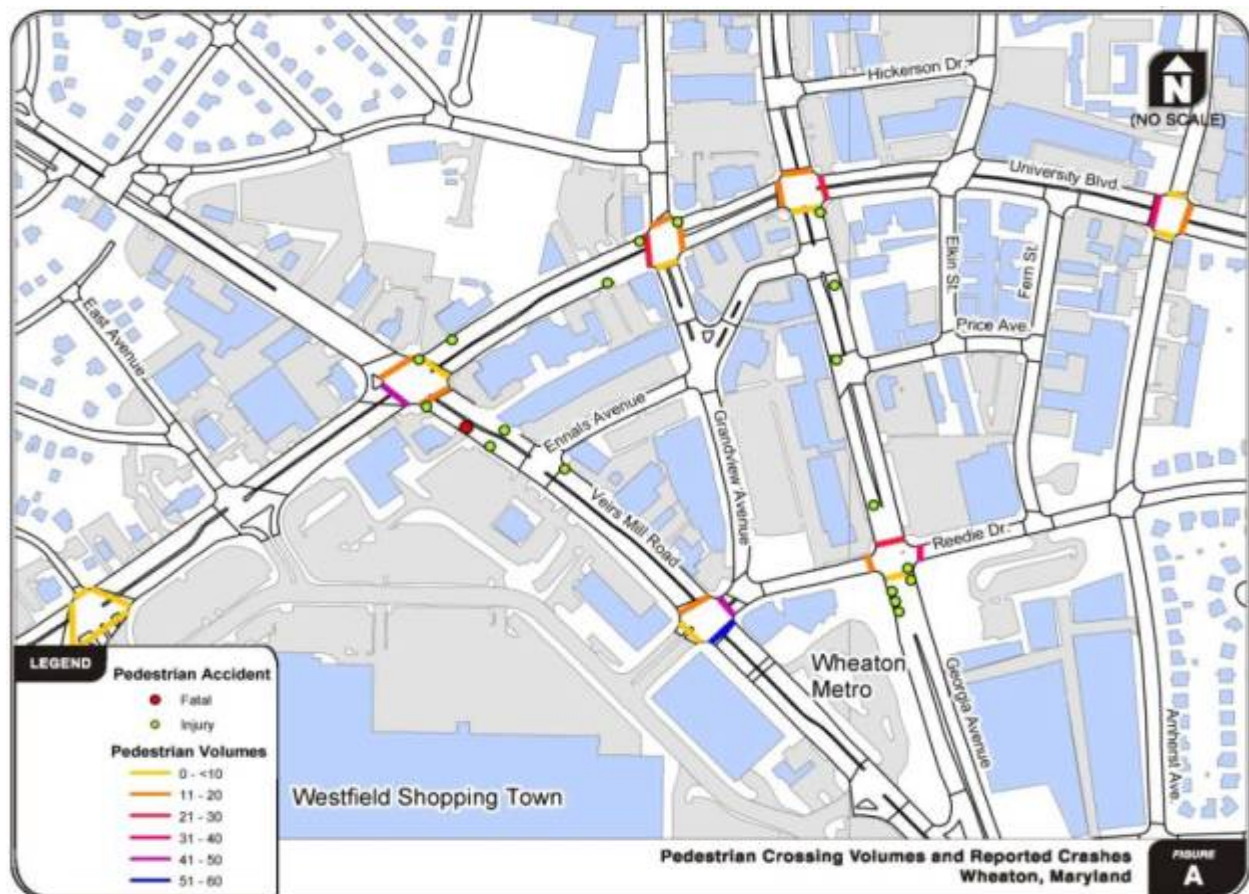


Figure A – Reported crashes involving pedestrians and pedestrian crossing volumes at signalized intersections. The map does not reflect mid-block crossing activity. Source Montgomery County Traffic Engineering May 2000-2001 and SHA Highway and Traffic Safety Office 2000 through 2002

Safety Record

In 2002, SHA and the Maryland Transit Administration (MTA) field verified an inventory of pedestrian access to fixed rail transit stations around the State as part of a program called Access 2000. Findings at the time indicated very high sidewalk coverage and ADA accommodation in Wheaton as shown on the aerial map on page 16. Access 2000 data does not provide a complete picture of safety in the area. According to 3 years of crash data presented in Figure A, the arterial roads, analyzed as part of this study, are not especially safe for pedestrians. Wheaton's pedestrian crossing volumes were summarized and compared to the 19 locations of pedestrian-vehicle crashes. Figure A shows that the two areas with the highest density of pedestrian related crashes are south of Reedie Drive on Georgia Avenue, and between Ennalls Avenue and University Boulevard on Veirs Mill Road. As shown in Figure B, transit stops are located on both sides of Veirs Mill Road, north of Ennalls Avenue. Field observations confirmed this to be a high volume mid-block pedestrian crossing location.

Accident reports for the crashes above revealed a high degree of pedestrian error, implying that engineering solutions could not fix the problem. The prevalence of pedestrian crashes in similar places requires a reevaluation of the question. Positive guidance for pedestrian crossing safety and clear signals

to the driver to expect pedestrians and adjust driving behavior can be provided. These opportunities lie both within the right-of-way and in the urban design elements of the area.

Road Maintenance & Traffic Operations

Oversight of the building, operations and maintenance of road infrastructure in Wheaton is provided by state and local transportation departments. While pedestrians are not the main focus of network design, their safe use of the system relies on policies, standards, and practice of these agencies to effect the physical dimensions such as roadway lane width, space for parking and bicycle accommodation at the road edge, and the accommodation of curb extensions, pedestrian refuge islands, medians and landscaping within the right-of-way. In established areas, where the basic road network is generally complete, intersection operations create the greatest sources of conflict in design and operations. Traffic signal phasing to minimize vehicle delay, increased roadway space to allow free rights, and additional capacity for left turns are typical congestion mitigation measures at intersections. These measures often conflict with optimal pedestrian accommodation requiring a more comprehensive approach to mitigation alternatives analysis.

State Responsibilities

Traffic management on Maryland's State Highway system is the responsibility of the Office of Traffic and Safety (OOTs) and the Assistant District Engineer for Traffic (ADE/T) in each of SHA's seven district offices. The District responds to capacity and safety concerns brought by the public and observed in the system. Further, a pedestrian safety coordinator, designated to work with communities to design and implement improvements, operates from the district office. District Traffic staff collaborate with the SHA design offices in headquarters, traffic engineering offices in Hanover, and designers in the district to maintain and improve geometry and signals operations on the system. Spot safety, roadway maintenance, reconstruction, and community enhancement programs are established as a part of the annual budget process and are able to include pedestrian safety project elements. Improving pedestrian safety performance through state improvement programs is particularly effective when coordinated with local plans and initiatives. An important aspect of SHA district office work is communicating with local officials to coordinate the design and execution of projects. SHA's Office of Traffic and Safety also supports pedestrian education and enforcement initiatives in collaboration with local governments through grants and technical assistance.

Local Responsibilities

Unlike any other jurisdiction in Maryland, maintenance of traffic signal timing on the state highway system is the responsibility of the Montgomery County Department of Public Works and Transportation (DPWT). Other responsibilities include County Parking Districts, Ride-On Transit Service, and local road and path design, construction and maintenance. While all of these elements are critical to a safe and well-designed pedestrian environment, congestion is a major concern in Montgomery County. Balancing very high auto demand with the comparatively low ratio of pedestrian activity in signal operations must be reconciled to balance the needs of all users. DPWT recently established a pedestrian coordinator position that will help to bring about policy changes internally and respond to pedestrian safety requests for intervention.

Buildings, Pedestrian Environment, and Zoning Codes

Buildings, their relationship to one another and to the street, their appearance including placement of doors and windows, and the treatment of access and parking support, shape the environment for pedestrians in suburban environments. Planning policies, zoning and building codes, and design standards that agencies use to guide private development and transportation improvements in suburban environments will ultimately affect the pedestrian environment.

Local examples of the regulatory environment at work are the recent food store developments in Wheaton and Silver Spring. The Whole Foods Store in downtown Silver Spring occurs within an urban fabric in close proximity to comparable uses and a large shopping mall. Its context is best characterized as a “Main Street” setting forming a well-lit and attractive addition to the growing attractions and 12-hour street life of downtown Silver Spring. The building, with its windows and doors oriented to the street, two-story scale related to the width of the street, and ample sidewalk, create a comfortable pedestrian environment. The success of this building and its contribution to Silver Spring’s center has come about through a combination of planning, regulations, and coordinated implementation.



New Whole Foods store in Silver Spring's evolving downtown core.

By contrast, the recently completed Giant Food Store in Wheaton is separated from the other buildings on the site, a Starbucks, a bank, and the regional mall, by surface parking lots and driveways. While the developer has included new sidewalks to move pedestrians safely through the site, the basic urban design concept does not support short walks between related uses, nor an attractive pedestrian realm created by a Main Street/Urban Boulevard street hierarchy. Its buildings, oriented toward parking lots rather than a street; and access from University Boulevard, while marked for pedestrians, create a site layout that is distinctively auto-oriented.

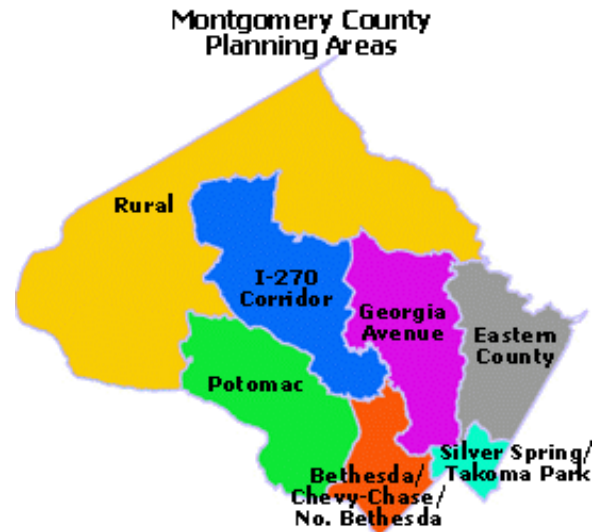
These differences in development approach demonstrate the need to channel market response through a more current planning vision, supported by an effective regulatory framework. The large trade area targeted by mall owners and their anchor tenants indicate that much of its market will arrive by car and will prefer quick and convenient access to the site and to parking. Without regulatory leverage, market perception favoring auto-oriented design will prevail.

Planning Guidance

As important as agency process and physical characteristics, planning documents for an area can affect the level of detail given to pedestrian issues. The following section presents Maryland National Capital Park and Planning (MNCPPC) guidance available to Wheaton from the broad General and County Transportation Plans to the more local Community Master Plan and CBD Sector Plan.

General Plans

The *Montgomery County General Plan for the Physical Development for the Maryland-Washington Regional District* provides Countywide policies to guide future development. Wheaton lies within the Georgia Avenue planning area and is guided by the *Kensington-Wheaton Communities Master Plan*, adopted in 1989. Consistent with the policies set forth in the General Plan, the area plan amends that guiding document with a vision that responds to the unique needs and characteristics of the sub-area. Its broad policy recommendations address land use, transportation, community facilities and services, natural environment, and historic preservation.



Montgomery County Planning Areas.

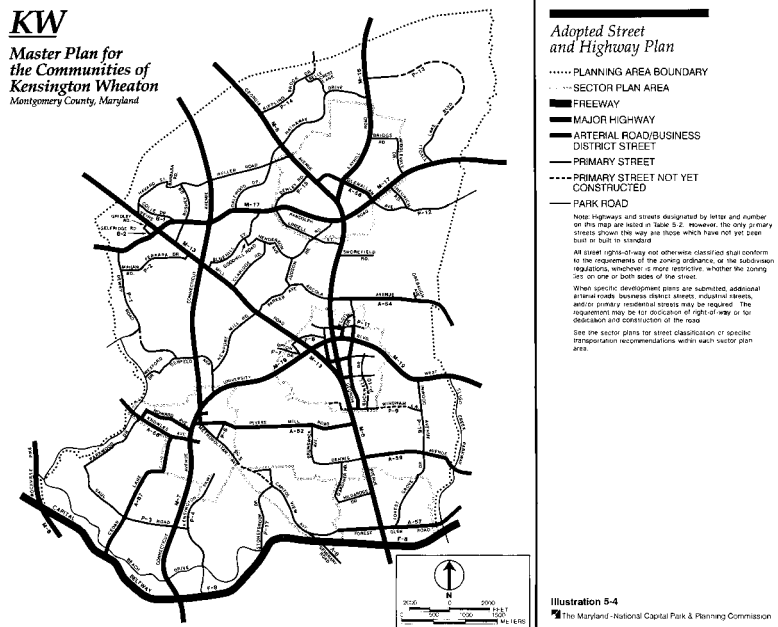
Regional Transportation Plan

The Master Plan's Transportation and Mobility Plan focuses on all aspects of the transportation system within that area north of the Capital Beltway. Wheaton's place in the regional network and Montgomery County's functional classification of its key roads is shown in the graphic below. MNCPPC provides level of Service "D" as an appropriate average for overall movement in the area due to the availability of transit in Wheaton.

State Routes traversing Wheaton are classified within the Community Master Plan as "Major Highways" providing "a high level of traffic service and low level of land service." This classification prescribes a 120' proposed right-of-way width and 6 lane divided roadway.

The plan identifies Reddie Drive and Grandview Avenue as "arterials and business district streets," important for local development access. Their prescribed right-of-way is 80' with a 48' paved section. Blueridge Ave is a collector or "primary residential street" with 70' right-of-way and 36' pavement width, carrying local traffic between higher order roads to secondary residential streets.

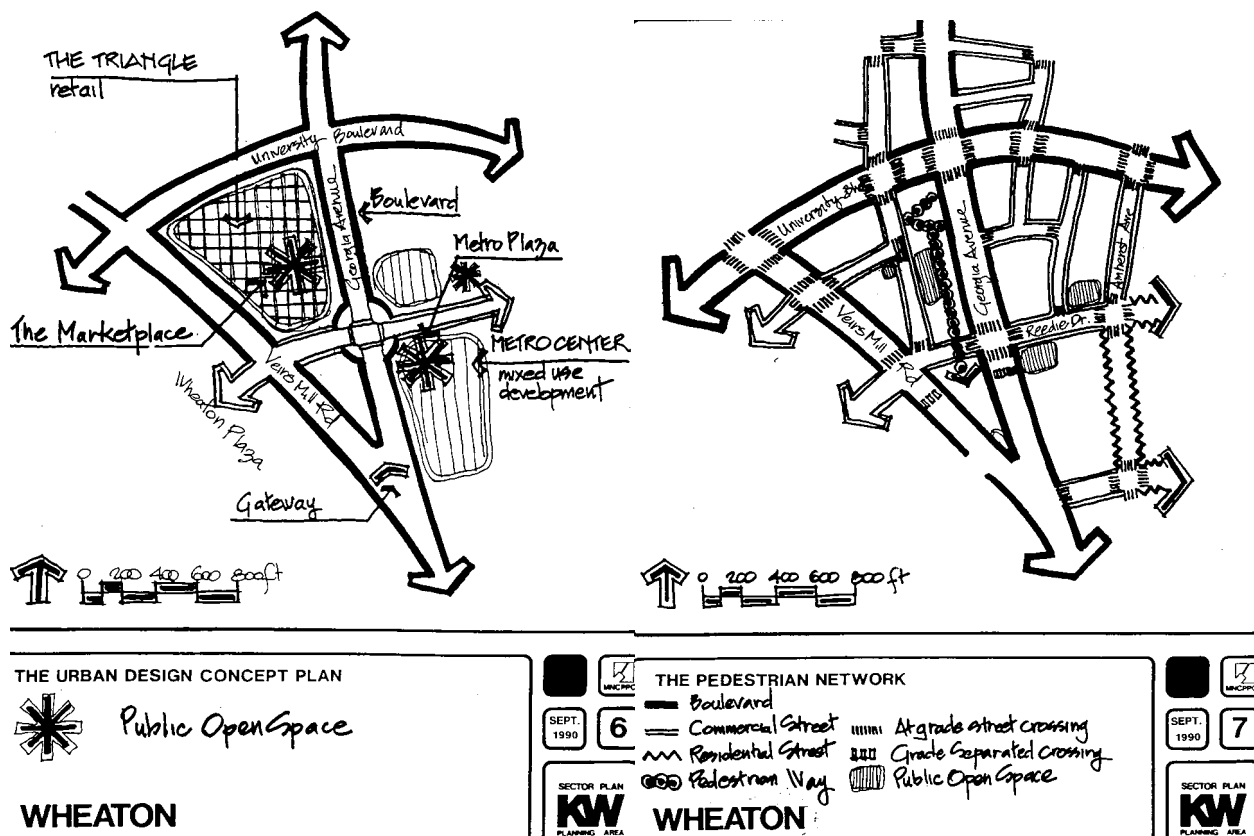
The *Master Plan's* pedestrian and bicycle policies suggest development and maintenance of sidewalk and multi-use trail systems on major corridors and connections to neighborhoods, commercial and employment areas, and Metrorail stations. Typical roadway cross-sections for each functional classification indicate sidewalk and bike lane or path space and offer dimensions based on adjacent use. The document defers to the Sector Plan and



individual intersection studies regarding specific improvements. The importance placed on the Sector Plan reflects the high value Montgomery County places on its community approach to sub-area planning for capital improvements and development.

Wheaton Sector Plan

Adopted in 1990, the Sector Plan expands on the policies in the *General* and *Master Plans*. Its vision of a mixed-use, transit-oriented center acts as a zoning and site plan review overlay. It provides detail and guidance to MNCPPC staff planners and engineers in their analysis of development applications, the Planning Board in its approval processes, and County and State engineers determining off-site and mitigation improvements. As such, it is a reference for private developers, WMATA, and property owners in their building projects, and all local public agencies in capital improvement programming.



1990 Wheaton Sector Plan Urban Design Concept Plan and Pedestrian Network guide development and roadway improvements reinforcing pedestrian activity and circulation.

The Sector Plan has enabled street oriented building layouts, reductions in on-site parking, and public plaza spaces in recent pedestrian-supportive site development in and around WMATA properties east of Georgia Avenue and at the corner of Reedie Drive, Grandview Ave and Veirs Mill Road.

The Sector Plan's Transportation element also updates the County's *Master Plan of Highways*, the document used to establish functional classifications and related design standards. The Plan's Land Use and Zoning section describes the State highways as boulevards and presents the idea of the pedestrian realm that is aesthetically pleasing with a traditional town-like street hierarchy. While speaking to the

importance of connections the plan assumes no fundamental change to the disconnected local street pattern that exists in Wheaton today. Now nearly 14 years old, the Wheaton Sector Plan is no longer able to fully implement the vision of many of its creators or adequately reflect changing market opportunities.

Key aspects of the plan that can better reinforce the vision of a more walkable Wheaton include the following:

Street Network

- Traffic and roadway elements provide for access to and through the CBD. The current plan considers these elements with an auto orientation and recommends roadway improvements related to regional transportation function. The current sector plan assumes that Wheaton is the end of the Metrorail Red Line for the anticipated 10-year duration of the Plan, emphasizing station access for commuters arriving by car and local road improvements to enhance capacity. A sector plan update should address the system's performance for pedestrians, especially considering Metro access within the half-mile area, as part of the traffic and roadway elements.

Pedestrian Network & Facilities

- A pedestrian network, when specifically addressed as such, can establish a system and features at a walking scale that can be built into future public and private projects. The current plan details potential sidewalk and land use improvements to increase pedestrian comfort of existing streets including "wider sidewalks, landscaping, street furniture and [possible] street narrowing," on Georgia Avenue, University Boulevard, Reddie Drive and Ennalls Avenue. Future updates should consider a fully linked network of at grade, pedestrian scale routes and any connections needed to create it.

CBD Boundaries

- Boundaries help to define the area of the suburban center and ensure that all possible parts are fully integrated with similar standards for streets, access, buildings, parking management and pedestrian amenities. Wheaton's boundaries do not include critical commercial geography creating an inconsistent vision for downtown. Any update of the sector plan will need to consider broadening CBD boundaries to include places like Westfield.

Redevelopment Incentives

- Redevelopment incentives can help to address needed changes in land use and urban design aspects to support pedestrian safety and comfort in a suburban center. In seeking to retain a strong local retail presence, the current sector plan established the concept of a Retail Preservation Overlay, effectively reducing incentives to upgrade aging properties. Any update should consider ways to refine and provide additional incentives to encourage redevelopment of strip commercial properties to provide densities, building orientation and amenities that will contribute to Wheaton's pedestrian environment.

Land Use Control

Land use control is guided by local ordinance that qualifies permitted uses, development patterns, access controls, parking requirements and related improvements from private developers and property owners. The multi-agency review of applications presents an opportunity to coordinate a variety of agency perspectives and actions to enhance pedestrian related decisions and approvals.

Development Review

The Montgomery County area master plan defines a vision and guides development at the community level. The zoning process follows the master plan process. In the case of Wheaton, the zoning of land is accomplished through the Sector Plan.

The next level of land use control is the subdivision process. The subdivision process requires public notice and a public hearing before the Maryland-National Capital Parking and Planning Commission (MNCPPC). The Planning Commission Board issues its final decision in an Opinion Letter and identifies conditions to be met if the application is approved.

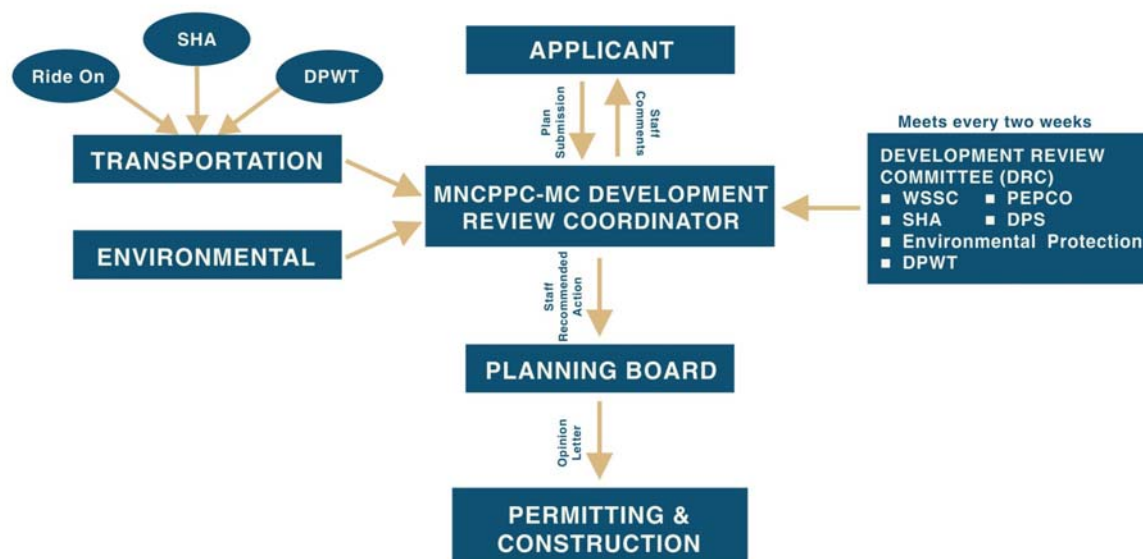
The diagram below illustrates the subdivision application process. A Development Review Coordinator leads this process. Once an application is submitted, the Development Review Coordinator solicits comments from the County's transportation and environmental staffs and the Development Review Committee, an interagency task force that includes members from public agencies and utilities.

MONTGOMERY COUNTY LAND USE CONTROL PROCESS



Montgomery County Land Use Control Process.

MONTGOMERY COUNTY SUBDIVISION REVIEW PROCESS



Montgomery County Subdivision Review Process.

The final step in the land use and control process is site plan review. Site plan reviews are performed by the Department of Permitting Services and are strictly a ‘check’ against County adopted regulatory standards. Applications that do not require a subdivision can simply go directly to the Department of Permitting Services and avoid the staff review and public hearings process.

Traffic Analysis

The Transportation Planning Section, within the County-wide Planning Division of MNCPPC-Montgomery County, performs transportation reviews. The *Local Area Transportation Review (LATR) Guidelines* define the scope of work for a traffic study and establish criteria to determine whether a development can or cannot proceed. The LATR Guidelines identify congestion standards for each of the policy areas shown in Figure 4. Rural Areas have the lowest Critical Lane Volume Standard (1,450 vehicles per hour) while Central Business District’s (CBD) have the highest standard (1,800). As a CBD, the Wheaton metro area is permitted an intersection critical lane volume of 1,800 vehicles per hour. This level of congestion reflects an intersection that operates at or just above capacity during the peak hour. This contrasts with guidance from the *Kensington-Wheaton Communities Master Plan* that suggests a level-of-service “D” standard for all intersections. While an intersection may have a CLV of 1,800 and operate at LOS “D”, an intersection with a critical lane volume of 1,800 vehicles per hour will likely experience vehicle delays that are worse than LOS “D” conditions.

Pedestrian Impact Analysis

Seeking to encourage pedestrian travel as an alternative to the automobile is an active policy in Montgomery County. The County has been a leader within Maryland in retrofitting communities with sidewalk improvements. Since 1996, the County’s installation of 70 miles of sidewalk along state highways as part of SHA’s sidewalk retrofit program is nearly double that of the nearest subdivision. As transit use grows in suburban settings, strategies for completing fully connected pedestrian systems rely on improvements through the development of new projects, both public and private.

Private Development Pedestrian Analysis

The LATR CBD Guideline requires pedestrian access consideration and counts at intersections as a component of meeting adequacy of public facilities. The LATR Guidelines indicate that conflicts between pedestrians and vehicles accessing the site shall be minimized and that



Montgomery County Central Business Districts tolerate higher levels of congestion to promote active commercial centers at major crossroads.

applicants provide evidence that the pedestrian phase of the traffic signal cycle for all approaches at adjacent and critical intersections is sufficient.

Land use applications submitted to the County for subdivision review are required to meet Adequate Public Facilities tests. “Loophole” properties, are those lots recorded prior to 1982 and registered with the Planning Board by July 1, 1990 excluded from this requirement and are typically held to a lesser standard. The Westfield Shoppingtown is classified as a loophole property.

Capital Project Pedestrian Analysis

Montgomery County currently requires three different pedestrian impact analyses. Capital improvement projects prepared by the Department of Public Works and Transportation use the guidance summarized in the figure below to ensure its projects have considered pedestrian safety and access. Parks & Recreation has another set of criteria for its projects, and new development is required to identify pedestrian activity as discussed in the previous section. The concept of systematic review of potential pedestrian impacts came about in response to County and community concerns about pedestrian safety and recognizes that encouraging pedestrian access requires an awareness of opportunities and needs by agency staff.

The fact that each user agency has prepared its own form of pedestrian integration into its procedures reinforces the concept specific to agency culture. Procedures have been effective to bring awareness to the issue of pedestrian safety with new improvements and the State Highway Administration is considering adopting a similar requirement. Agency staff suggested consolidating these into a single set of standards and including specific and prescriptive best practice guidance to establish a baseline policy and bring about greater consistency in outcomes.

Capital Projects Pedestrian/Bike/ADA Analysis

- **Connectivity** - Destinations within 2 miles to connect schools, parks, commercial/retail, employment centers, public facilities
- **Master Plan Issues** - Master plan, recommendations for sidewalks, bikeways, streetscape requirements
- **Existing Conditions** - Existing crosswalks, sidewalks, curb ramps, street lighting, pedestrian signals and bus stops. List missing items and deficiencies. Pedestrian/bike accident history
- **Recommended Improvements** - Identify pedestrian improvements to enhance/improve existing conditions or provide pedestrian/bicycle accessibility
- **Additional Cost/Impacts/Issues** - Extraordinary costs or impacts created by provision of pedestrian, bicycle or ADA accessibility

Montgomery County’s pedestrian impact review checklist for all non-recreational capital improvement projects.

State Highway Access Permits

The Engineering Access Permits Division (EAPD) of the Office of Highway Development within the State Highway Administration (SHA) “administers state regulations pertaining to state highway access for commercial and subdivision development. EAPD issues access permits for commercial entrances, street connections and highway improvements and coordinates with local governments during the approval process for land use, subdivisions and developments. EAPD ensures that development adjacent to SHA's system appropriately mitigates the safety and operational impacts of increased traffic.” SHA relies on the availability, completeness and currency of local plans to inform its decisions. In absence of certain planning guidance SHA access permit staff exercises best judgment.

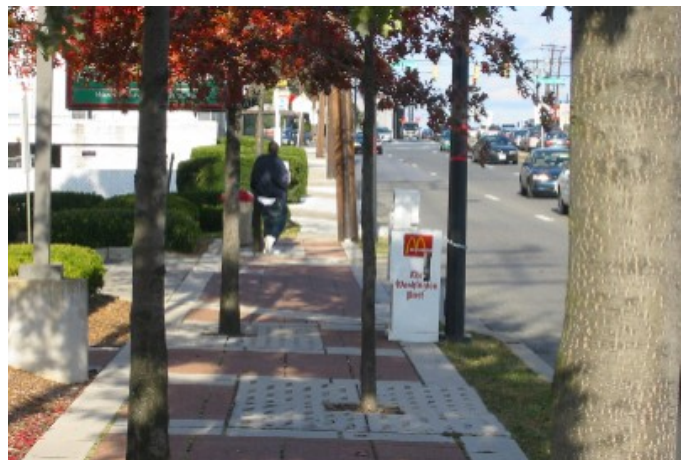
SHA is currently updating its access management guidelines. The spacing, number of and location of driveways are addressed in existing guidelines but are typically negotiated with the developer and local review agency through the review process. During its negotiations, the Access Permits Division attempts balance property access with traffic safety and capacity by minimizing the number of conflict points and maximizing spacing from key intersections.

In recent years the Access Permits Division has included the provision of pedestrian connections to adjacent transit stops in the review of site plans. SHA is currently considering a change to add specific requirements for pedestrian safety access permitting. This effort has the potential to bring greater awareness to pedestrian circulation and access, as part of an integrated transportation network in areas with high pedestrian potential. To be most effective the policy should be as prescriptive as possible and directly linked to specific land use and multimodal conditions and visions.

Street Design Standards

The Montgomery County Department of Housing and Community Affairs maintains Streetscape Standards for the Wheaton Central Business District. The Standards guide design of capital improvements and review of development during the permit approval process.

Frontage improvements are recommended at specific locations throughout Wheaton, but have not been consistently applied. The McDonalds (shown here) and Giant Food Store on University Blvd west of Veirs Mill are recent examples of improvements that could not meet the guideline. While aesthetics have improved, only minimum pedestrian safety and comfort was provided. Ensuring that the guidelines consistently produce an unobstructed and appealing path, the guidelines should be revisited. Coordinated review of the Standards with related agencies might also prescribe other important features of the pedestrian realm including driveway width and spacing, bus stop placement, and open space characteristics.



Streetscape improvements on University Boulevard create attractive but unusual obstacles and materials for visually and physically challenged pedestrians.

Transit Stop Location

While engineering cannot prevent poor pedestrian choices made while running for the bus, or short cutting at an unmarked section of highway, locating stops close to safe crossing locations improves the likelihood that marked crosswalks will be used. Up-to-date schedules and real time arrival and departure information can also help. The list below outlines multiple and sometimes conflicting criteria that must be addressed to locate a bus stop or shelter in Montgomery County. In coming months 500 new shelters will be replaced or added to the County's network. Working closely with traffic and highway engineers will be an important part of obtaining related road and intersection improvements.

SHA has also recognized the safety problem created by increased transit service in a poorly performing pedestrian environment and has taken a lead role working with transit providers to institute pedestrian safety criteria in the placement of shelters and bus stops.

Montgomery County Bus Stop Location Criteria

- Proximity to trip generators
- Safe pedestrian access and waiting locations
- Close to intersections/cross streets, with controlled pedestrian crossing locations
- Sufficient sight lines to see waiting passengers.
- Sufficient distance from next bus stops for convenient walking distance (500')
- Far enough from intersections or cross-street not to impede traffic flow or turning movements of vehicles (40' nearside stops and 80' farside stops).
- Stops well lit by street lighting
- Bus should be able to get to the curb, clear of parked cars.
- Try to avoid right-turn only lanes.
- Try to pair bus stops with mates across the street
- Rural & Suburban settings: locations for bus to pull off the roadway or out of traffic.
- Avoid locations that will interfere with adjacent businesses or homes

Montgomery County bus stop and shelter locating criteria. Several criteria are specifically designed to improve pedestrian access safety.
Source: Montgomery County Department of Public Works and Transportation

Transit Oriented Development

The Washington Metro Area Transit Authority is a major player in the success of Downtown Wheaton. WMATA has made considerable progress in recent years soliciting development proposals that build walkable urban places. As a landowner of property proximate to its stations, its approach to development can create development patterns that encourage pedestrian safety.

WMATA encourages responders to create projects that:

- “Reduce auto dependency;
- Increase pedestrian/bicycle originated transit trips;
- Foster safe station areas;
- Enhance surrounding area connections to transit stations, including bus access;
- Provide mixed use development, and the opportunity to obtain goods and services near transit stations; and
- Offer active public spaces.”

WMATA TOD Criteria Best Practice Checklist

- Mix of Uses
- Composition of Uses
- Non-Vehicular systems
- Non-Vehicular access
- Public Open Space
- Public Art
- Parking Reduction Strategies
- Auto-use Reduction Strategies
- Local Agency Collaboration
- Development Team Expertise

In 2002, WMATA issued the “Transit-Oriented Development Criteria: A Framework for Screening Station Area Proposals” to give reviewers a checklist of “best practice” items. The list includes the mix and composition of uses, non-vehicular systems and access, public open space and art, parking and auto-use reduction strategies, local agency collaboration and development team professional expertise.

This new screening criteria offers evidence of WMATA’s understanding of the pivotal role its activities play in Wheaton’s redevelopment success. Collaboration between the State, County and WMATA to realize local redevelopment goals when selecting a developer is critical. This work need not wait until the request for proposals. A local vision for the area prepared in advance of this opening of the window of opportunity will help to produce the greatest improvements and streamline review of plan compliant projects. Further, specific ideas and goals with broad support can balance agency review with community context. In Montgomery County this vision and specific guidance is typically provided in the local area sector plan.



Live work units under construction on Georgia Avenue at the Wheaton Metro Station

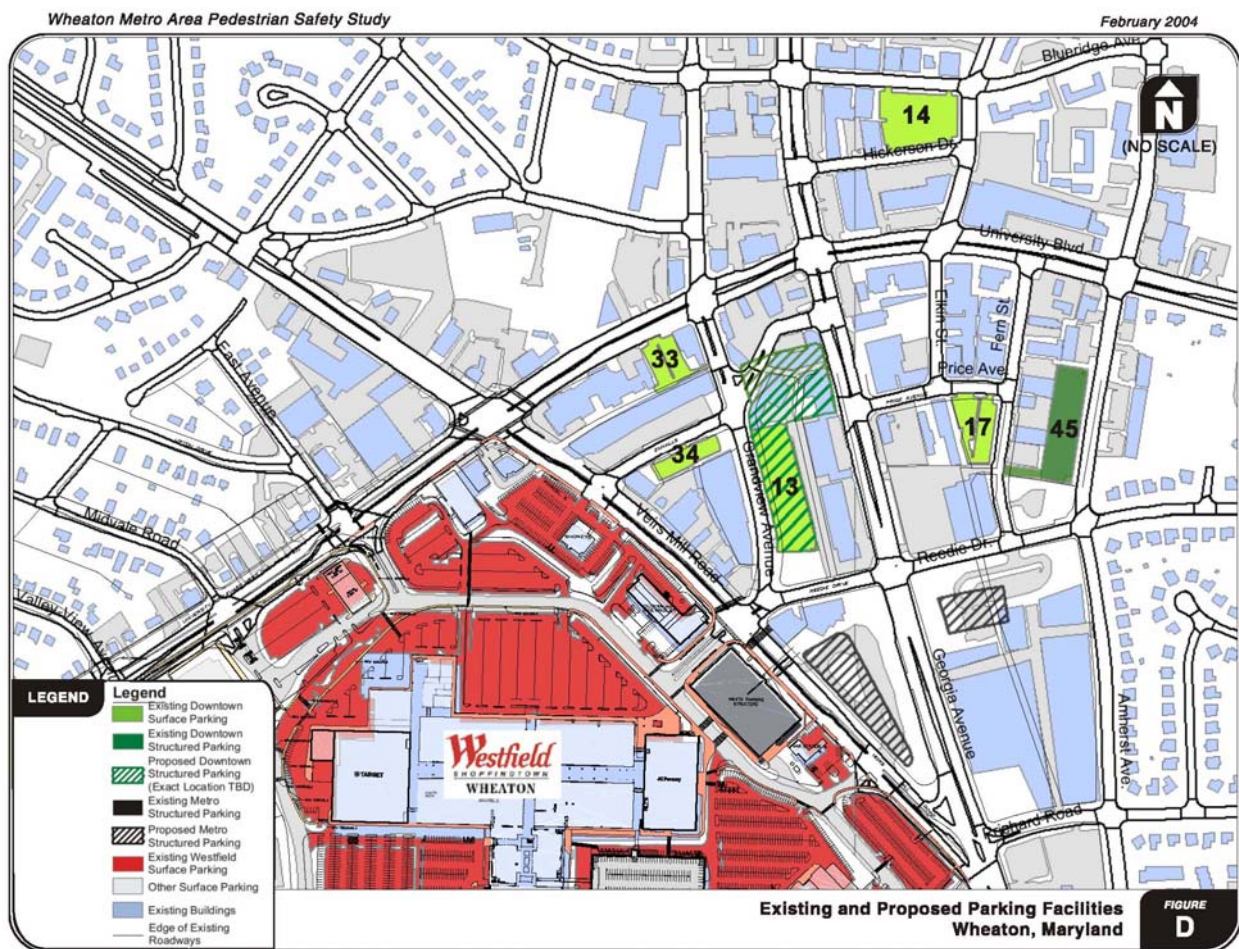
Parking

System Design

Parking systems are often managed to support broader transportation and economic goals in urban and urbanizing areas. The physical characteristics of parking facilities such as location, design, and orientation can have a major impact on the look and feel of a place and significantly add to or detract from the comfort of the pedestrian. As seen throughout Wheaton, surface lots of off-street parking and large driveway access points can interrupt pedestrian paths, creating “dead space” within an otherwise active area. Proximity of parking to related uses is another issue in Wheaton where wide high-volume roadways separate designated employee and commuter parking from employer destinations and the Metrorail station access.

Parking Supply

The availability of parking, its price, and use limitations influence travel mode choice. In addition to transit access and convenience, parking for the long term and commuters can be located and priced to reduce competition from customers seeking short-term, close-in parking. Excessive parking will typically



encourage single-occupant vehicles. An abundant supply of inexpensive parking can also create a disincentive to use transit. The resulting traffic congestion adds to vehicle/pedestrian conflicts and can decrease overall system efficiency.

Montgomery County Department of Public Works owns and manages approximately 1,350 parking spaces in the Wheaton Parking Lot District, including on-street spaces, surface lots, and one garage. Just over 60% of the spaces are designated for stays of four hours or longer. These are primarily located in the garage and are intended for CBD employees and commuters. The remaining spaces are restricted to time stays of three hours or less for customers and short-term visitors and are priced to support short-term parking.

Several private properties within the district have accessory parking lots, an on-site supply of parking related directly and only to the needs of that property. Many of these accessory lots are shared by multiple adjacent businesses.

Westfield Shoppingtown mall is located just outside the parking lot district boundary. Its relative scale, close proximity and abundant supply of free parking can have a significant impact on the operation of parking and general transportation within the Wheaton Parking District. Current arrangements allow district employees to park in the mall parking lot during the day, but Westfield is not obligated to maintain the agreement for the long-term.



Garage 45 provides Metro and employee parking on Fern Street behind the Safeway site on Georgia Avenue.

Parking Utilization

A downtown area's parking system is usually considered to be at its effective capacity when the system is around 85% to 90% full. At this level of utilization, the parking system feels full, individuals have difficulty finding parking, and some customers or visitors may choose to go elsewhere. Parking data collected by the County indicate that the district parking system was approximately 74% full during the typical weekday peak hour (1 to 2 p.m.) of the peak month (April 2003). The long-term parking was effectively full at 85% occupancy during the peak hour.

Wheaton is relatively unusual among urban areas in that the parking demand is highest on weekday evenings and weekends. This reflects an especially high amount of retail and restaurant activity, relative to office uses. As office development increases, demand for parking during the weekday hours will likely exceed the existing long-term supply. New parking or alternative access modes will be needed to accommodate this increased demand. Employer and operational incentives to promote alternative travel modes for commute trips will be an important consideration in the assessment of parking demand.

Heavy traffic on Georgia Avenue and Veirs Mill Road make crossing difficult for pedestrians. County staff has indicated that due to the crossing barriers, employees frequently use short-term spaces, particularly in Lot 13, rather than employee parking in Garage 45 and at the shopping mall.

This meter feeding by employees within the Wheaton Triangle reduces available parking for patrons and suggests the need for parking that does not rely on the crossing of major roads. Plans and designs for new development should consider public parking locations that are easily accessible from the regional network, and close to driver destinations. Structured parking design and location should reinforce the concept of a well-designed walkable street network. For example, when planning for the Metrobus Transfer Station redevelopment, an off-site or new public garage should be located within the Wheaton Triangle in a way that does not reduce Grandview's appeal as a walkable street.

Development and Management

Parking requirements for developments in Montgomery County are calculated using minimum ratios that are a function of land use, area of the county, and proximity to a Metrorail station. Developers within parking lot districts are not required to provide any parking because they pay a special tax intended to meet parking needs for the district. Developers who elect to provide all parking that would be required of a similar use outside of a parking district are often exempted from the tax. Tax reductions can be given to developers who provide a portion of the required parking, as specified in the code.

The special parking tax is calculated as a function of assessed property value while the costs to the County of providing parking for additional land uses is a function of parking demand. Lacking a direct correlation between the tax revenue and cost of meeting parking needs, may leave the County underfunded to meet its obligations to the parking district. The arrangement also introduces the potential for inequities among land uses in the application of parking and/or tax requirements. For example, land uses with low parking demand but high property value would end up subsidizing lower-valued properties with higher parking demand.

A modified parking tax could be assessed as a function of estimated parking demand, rather than assessed property value, to explicitly link the parking tax revenue to the County with the parking obligation it incurs.

The existing parking system is generally well-managed, with the most convenient spaces reserved for short-term use, and an adequate supply of convenient employee parking for current conditions. Constrained parking conditions during evening and weekend hours will require additional parking to support future development.

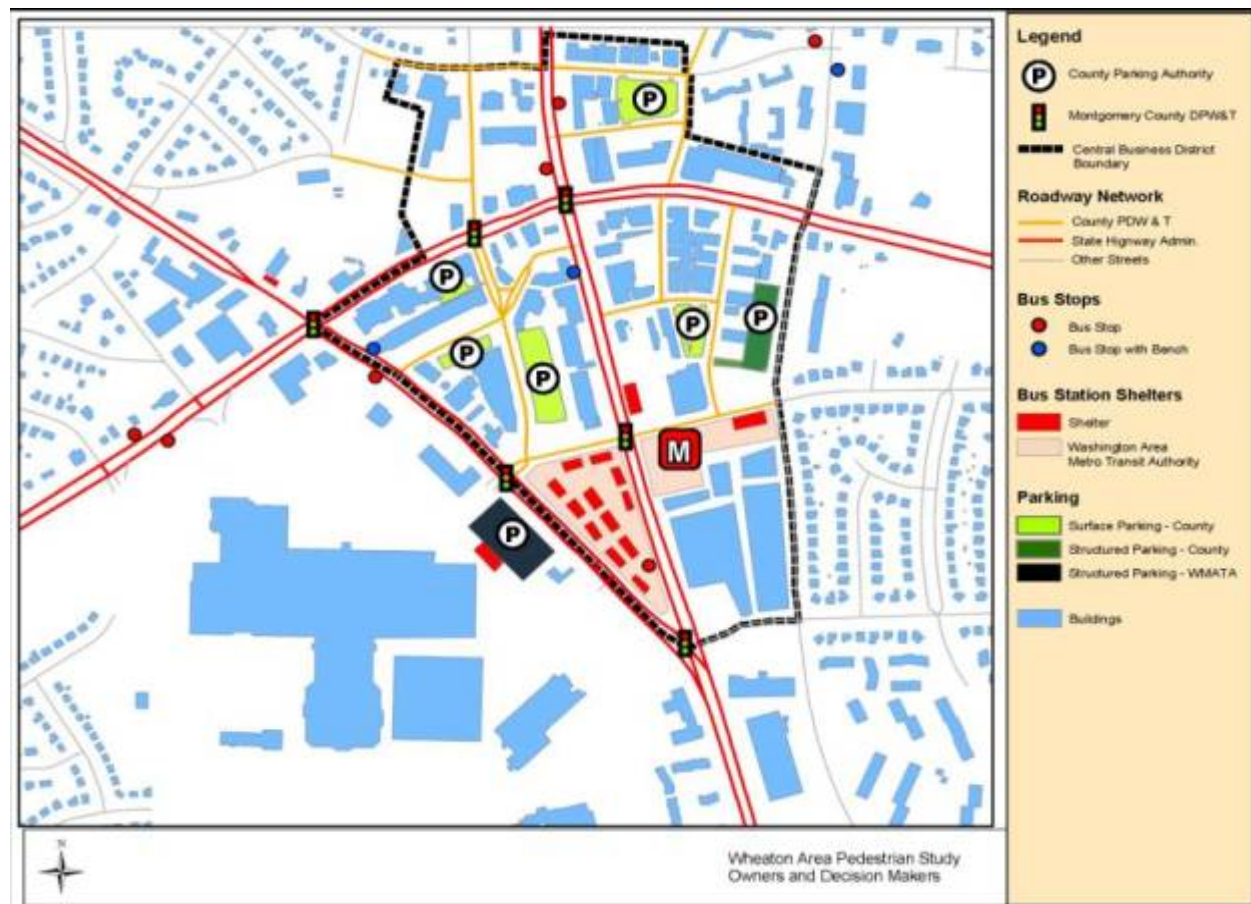


Short term surface parking on Lot 13 within the Marketplace Triangle.

Coordinated Decision-Making

Each aspect of Wheaton's environment is overseen by an agency with a core mission. Pedestrian safety can be overlooked if it is not specifically considered. Further, bringing about improvements in each of the core mission areas can be difficult to achieve alone, without the additional burden of coordinating with other agencies. One frequent example is the right-of-way allocation that must be distributed between sidewalks or roadway width for bicycles, wider lanes or dedicated turn lanes.

The diagram below demonstrates how the pattern of overlapping agency responsibility occurs on the ground in Wheaton. Each of the transportation elements is managed by a different part of the agency diagram shown on page 2. The complex inter-relationship of all of the elements to each other demonstrates that the area's success depends on each part fitting neatly into the whole. Decisions related to one element will naturally have the dominant perspective of the agency overseeing that element of the system. Clearly, the actions of one system can bring unintended consequences to another system, particularly when the impacts of the change are not checked against the others.



Downtown Wheaton agency responsibilities map.



Bus stop on Georgia Avenue

A typical example is the location of a bus stop. The transit operator typically considers stop spacing to optimize service to customers and minimize resistance from adjacent property owners. Pedestrian access safety and comfort are traditionally beyond the scope of the transit provider. At a minimum, locating and improving stop access safety requires that the transit service provider coordinate with the owners of the roadway as well as the owners of the adjacent property. Likewise, a roadway maintenance project that includes sidewalk upgrades should work with the transit provider to ensure that stops are well situated and properly sized so that changes can be added or incorporated to make appropriate improvements.

Maintenance projects, whether public or private offer an opportunity to adjust and correct elements of the transportation network that may be obsolete or single-mode focused. They can be combined or coordinated with other funds or developer activity to realize larger rehabilitation goals.

Public Participation

This study came about in part due to public recognition of a pedestrian safety issue in Wheaton CBD. Working with standing committees including a subcommittee of the Urban District formed to address pedestrian safety, made it possible to quickly bring ideas for improvement to the broader community and gain consensus. Introducing unforeseen or innovative ideas for change through development and related capital improvements often relies on timely and effective community involvement that can be provided by an established and recognized stakeholder group.

Most of Maryland's urbanizing suburbs depend on established County planning, zoning and public works processes to communicate with constituents about perspective area plans, large development projects, and capital improvement programs. The Counties typically hold public hearings to inform the public, receiving feedback from individuals or representatives of special interests or community groups. This prescribed formal process may not always be adequate in a period of dynamic change as is occurring in many aging suburban centers. Standing committees focusing on specific geographic areas and representing the broad range of community interests can get to know the details of a subdivision's sub-area and be informed and available to deliberate when opportunities present themselves, saving time and streamlining the development process.

The findings of this study recognize Montgomery County's approach to public involvement in its new CBDs offers a model that may be valuable in other unincorporated suburban centers. Two offices that have been established by County government to lend assistance are the Wheaton Redevelopment Office and the Mid-County Services Center. Both bring County government services to the community in the heart of the CBD. While the roles of these offices differ, the community knows their staffs and they offer a forum for community involvement and developer assistance that is essential to a collaborative and sustained effort to improve Wheaton. The Redevelopment Office in particular is able to focus on Wheaton's private sector opportunities, tracking progress on individual projects and assisting where necessary. It hosts several standing resident/business committees working on pedestrian safety and urban design whose members get to know the issues in detail, becoming better informed advisors, change agents and leaders of community discourse.

OPPORTUNITIES TO IMPROVE PEDESTRIAN ENVIRONMENTS

Based on interviews and meetings with developers and the Wheaton Advisory Group, reviews of existing conditions and studies, and application of widely accepted pedestrian and traffic safety standards from professional sources, a number of specific opportunities the Wheaton CBD were identified. Those presented here are organized according to the goals established by the Wheaton Advisory Group for this study:

- Support Logical Pathways, Connections and Pedestrian Crossing Safety
- Enhance Transit Stop Location and Amenity
- Improve Vehicle Safety and Wayfinding
- Strengthen the Walking Environment

The list of opportunities derived from this approach is not intended to be exhaustive for all similar areas or for every incidence in Wheaton; nor does it specifically detail bicycle or disabled pedestrian issues outside the scope of this study. It rather provides the fundamental elements of a concept to achieve pedestrian safety through good design practice, where modes and activities mix comfortably and share a common space.

Recommendations, both conceptual and specific, are presented in this chapter. Those pertaining to Wheaton are presented in italics.

Pathways, Connections & Crossing Safety

Roadway networks can be thought of as the skeleton of a place. They are not only a network of interrelated parts, but also provide structure to other elements that make up the whole. While the roadway network must serve its basic function, vehicle mobility, it should also give support to the more discrete aspects of the area, such as system connections and redundancy that enable internal circulation and access needs found in successful urban places. Creating these connections safely without deteriorating existing capacity can be accomplished through design solutions that better accommodate pedestrian needs while minimizing driver impacts. Some of the targeted improvements are described in this section and shown in Figure 1 on page 41.

Street Hierarchy

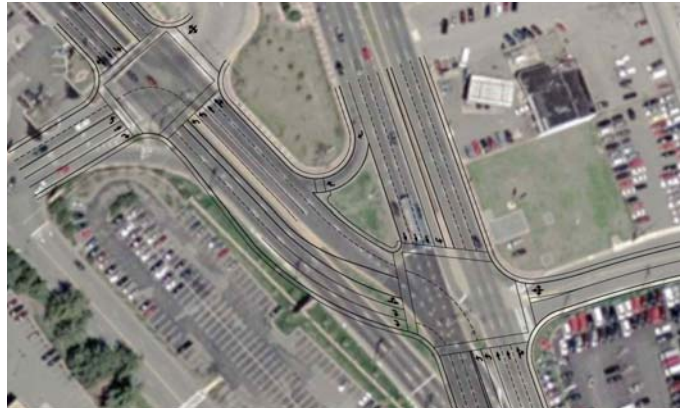
To serve pedestrians, the transportation network must move beyond the traditional roadway classification system that characterizes roads according to its traffic type. Physical aspects of the land use pattern and the presence of other users are elements that help to broaden the definition of roadway function, including a road's context as well as its traffic makeup. In urban areas the street hierarchy is better served using terms like "boulevard" and "main street" to conjure an image of a road within an urban place, serving a multitude of functions.

Wheaton's Sector Plan characterizes its major roads as boulevards reflecting their high traffic volumes, busy intersections, and visible crossing locations. Sidewalks are wide with ample separation from fast moving traffic. Building entrances are more formal and curb cut access into driveways is infrequent. Local roads become "streets" where people shop and dine along sidewalks close to the street and are more likely to provide access to shared parking.

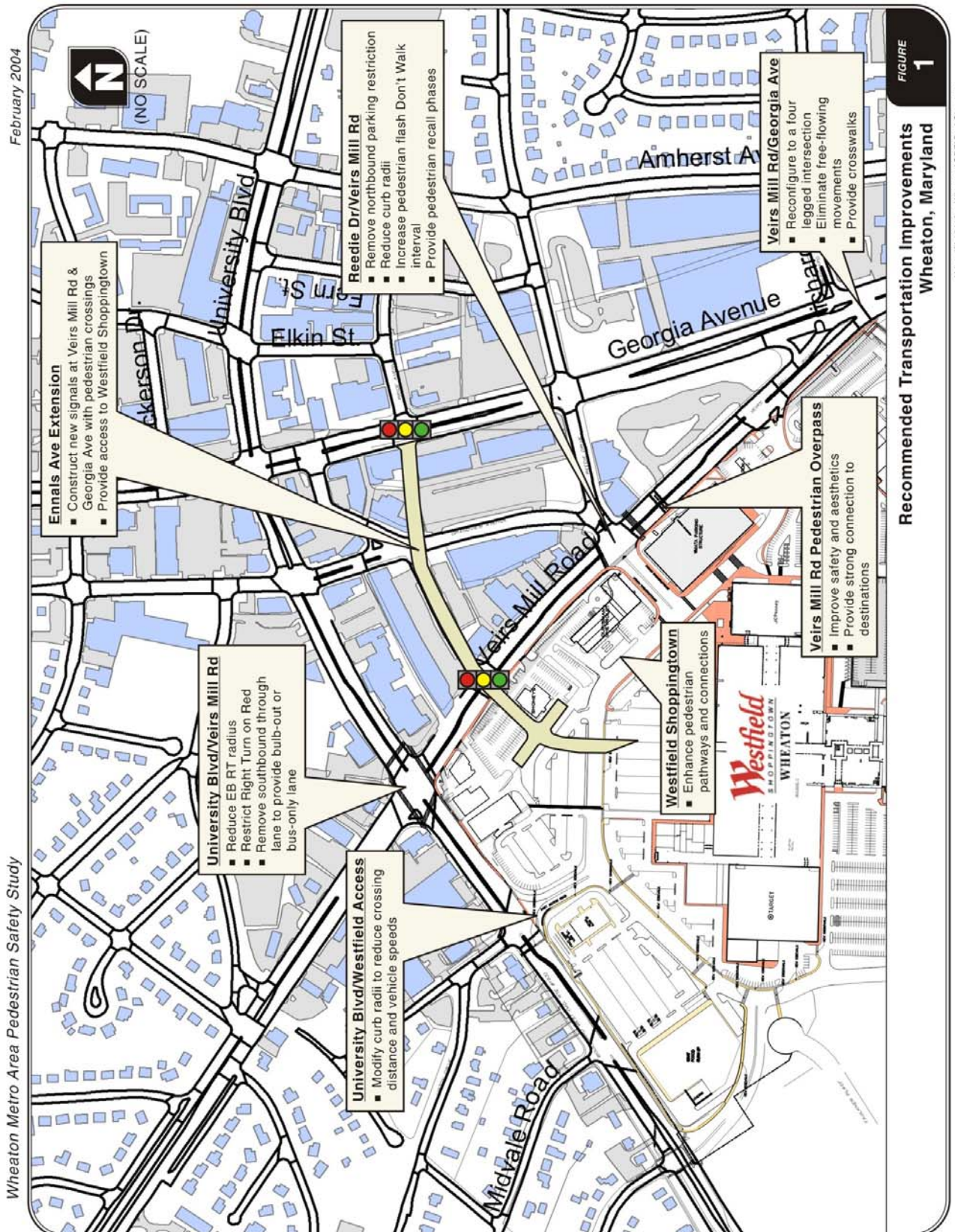
Visual Gateways

Gateway entries into dense activity centers and downtowns help provide visual cues to drivers that indicate an impending change in the nature of the roadway environment. They help raise drivers' awareness to increased traffic congestion, on-street bus and parking activities, and pedestrian crossings.

A critical location in Wheaton is the southern gateway at the Georgia Avenue and Veirs Mill Road intersection. The gateway appearance is already changing due to the addition of new developments that have constructed larger buildings closer to the street edge. To support the built environment, the Veirs Mill Road approach to Georgia Avenue directly opposite Prichard Drive should be realigned to intersect Georgia Avenue at an angle as close to 90 degrees as possible (shown here & in Appendix F). Crosswalks should be added to permit pedestrian crossings on the south, east, and north legs of the intersection. Results from a traffic operations analysis (Appendix B) show that adequate capacity is available with the improvements in place to meet SHA and Montgomery County traffic operations standards.



Reconfigured intersection at Georgia Avenue and Veirs Mill Road to provide enhanced crossing safety.



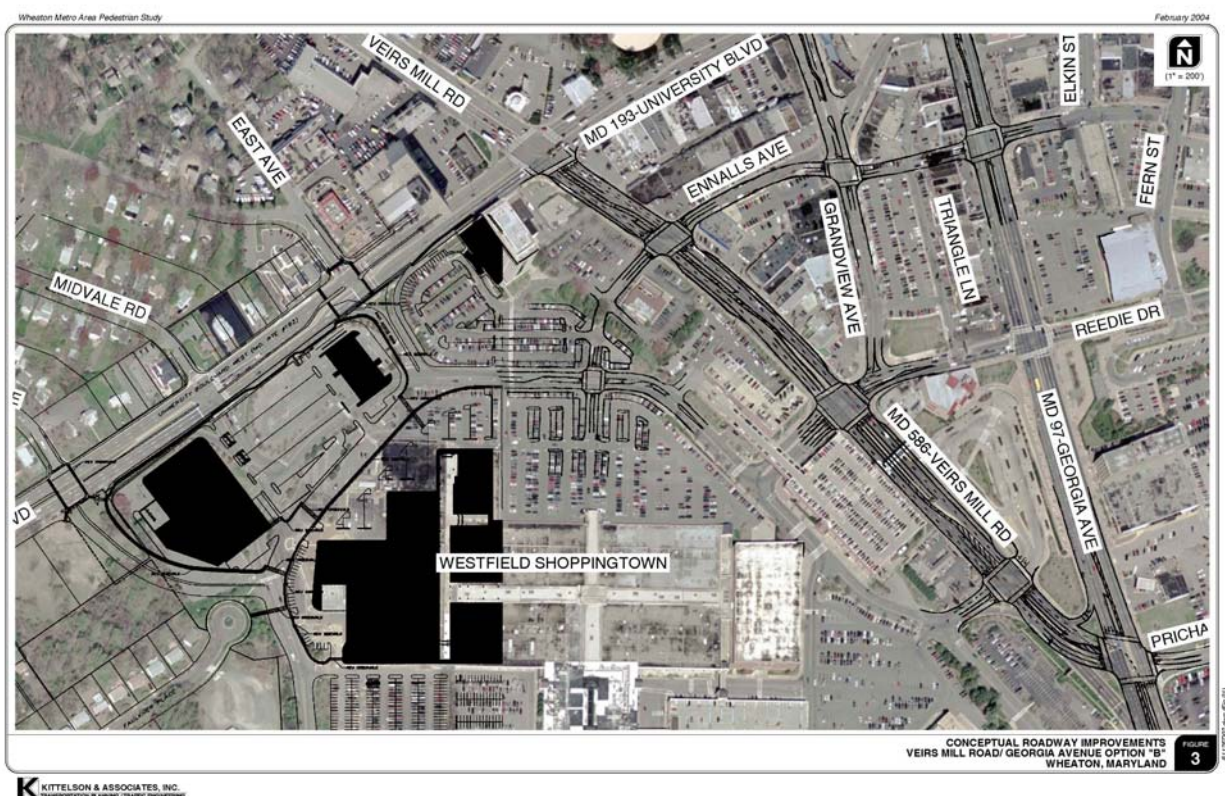
Connected Grid Network

Increasing network connections, particularly at the pedestrian scale, is necessary to convert a place designed exclusively for driving to one designed to safely and comfortably support walking. Missing links in both the pedestrian and automobile systems must be identified and filled in to create a grid network and establish connections at reasonably spaced intervals. In built-up areas, logical network connections should be developed by locating pedestrian generators near the paths typically used to reach them.

In Wheaton the opportunity to reinforce existing pedestrian desire lines across Georgia Avenue and Veirs Mill Road presents itself at two key locations: (1) the intersection of Ennalls Avenue/Veirs Mill Road and (2) the intersection of Ennalls Avenue/Georgia Avenue (indicated in Figure 3 below).

Ennalls Avenue provides a direct and parallel connection that supports access between Georgia Ave, the Marketplace Triangle, Veirs Mill Road, and the Westfield Shoppingtown. Providing a traffic signal at the Ennalls Avenue/Veirs Mill Road intersection would facilitate pedestrian movements across Veirs Mill Road and link the Shoney's driveway to the Mall circulator road. This improvement helps transform the mall's circulator road from a driveway to a street, especially if redevelopment occurs along Ennalls Avenue in Westfield and the Triangle that orients buildings and entryways to the adjacent sidewalk links.

The second location requires realigning the eastern section of Ennalls Avenue south from its current location to Price Avenue at Georgia Avenue, creating a four-legged signalized intersection and linking neighborhoods and local streets to the east of Georgia Avenue to the Marketplace Triangle.



Intersection Spacing

SHA practice is to maintain 1000 feet between two signalized intersections. This is desirable to reduce the potential for queue spillback between intersections and to maximize the progression of traffic flow between intersections. This spacing is often not achieved in older urban areas like Wheaton where major roadways serve transit, retail, or residential centers, and, correspondingly, heavy pedestrian activity.

Pedestrians in the suburban context will often choose to shortcut mid-block rather than walk out of direction to use a legal crossing. While pedestrian crossings are legal at non-signalized intersections, they may not be marked because of the potential false sense of security they can give to the pedestrian. The absence of a marked crosswalk in a busy unsignalized intersection causes confusion in the message to both driver and pedestrian as to priority and the safest place to cross. Further, in areas of high pedestrian activity, the manual on Uniform Traffic Control Devices (MUTCD, Section 4C) indicates a signal may be warranted when the distance to a signalized pedestrian crossing is greater than 300 feet.

Wheaton's proximity to three major state highways is key to its popularity as a retail destination. These same roads create many challenges for maintaining a safe pedestrian environment. The scale of local roadways in Wheaton such as Elkin Street, Fern Street, Grandview Avenue, Reddie Drive, and Ennalls Avenue help convey a comfortable feeling for pedestrians within the internal quadrants created by the major arterial roadways. But, extending that scale across the regional arterial network can conflict with SHA intersection spacing practice, as typically these new intersections warrant signals and a minimum spacing of one-half mile oftentimes cannot be achieved.

The close spacing of the recommended Ennalls Avenue/Veirs Mill Road traffic signal to University Boulevard begins to bring greater intensity to a suburban roadway context. It balances the need for well-defined, safe pedestrian accommodations and improved turning access in all directions with added delay to some through movements and potential queue interaction with the signal at University Boulevard during peak periods.

Travel Lane and Median Width

SHA policy that favors lower vehicle speeds, pedestrian safety and bicycle compatibility, particularly in physically constrained urban environments, has led to striping 11-foot lanes on many urban highway retrofit projects. Unlike many state DOTs, SHA's 11-foot lane policy does not require a design exception. SHA typically does not allow less than 11 feet on state arterials, without a design exception, to reduce the potential for sideswipe crashes particularly where roadways carry significant volumes of trucks and large buses.



A newly constructed crossing on University Blvd at East Avenue demonstrates the value of strong urban edges, especially when crossing occurs across many travel lanes.

AASHTO "Green Book" (*A Policy the Geometric Design of Highways and Streets*) guidelines and SHA policy indicate that left-turn lanes may be striped to 10 feet in areas with low truck volumes. Narrower

lane widths for dual left-turn lanes can be supported with wider receiving lanes and striping through the intersection to minimize sideswipe conflicts. Left-turn lanes in Wheaton today vary in width from 8 feet to 12 feet. SHA policy indicates that bicycle compatible roads can be striped with 14 foot outside lanes or 11 foot outside lanes with a marked 5-foot bicycle lane when adjacent to a curb or parking.

SHA promotes a 6-foot minimum pedestrian refuge through a median island on high-volume roads (SHA-Accessibility Guidelines for Pedestrian Facilities along State Highways, Nov 2002), consistent with guidance provided in the FHWA's "Designing Sidewalks and Trails for Access". According to SHA's guidelines, the median, "designed to separate opposing lanes of traffic, can also act as a refuge" where pedestrians risk being caught in the middle of the road when the pedestrian crossing phase ends. Limited right-of-way may require reducing median, sidewalk or lane widths in the allocation of space. Traditionally the travel lane width would receive preference over the median or sidewalk. In areas of high pedestrian activity, this balance should more heavily emphasize the pedestrian.



A wider median nose extended through the crosswalk provides a safe refuge for pedestrians caught between walk phases.

Intersection Corner Design

An intersection, as defined in the AASHTO "Green Book", is an area where two or more roadways, roadside facilities, or highways cross. It also states "the main objective of intersection design is to facilitate the convenience, ease, and comfort of people traversing the intersection while enhancing the efficient movement of motor vehicles, buses, trucks, bicycles, and pedestrians. Intersection design should be fitted closely to the natural transitional paths and operating characteristics of its users."

Encouraging pedestrians to obey traffic laws at busy intersections requires careful thought about intersection design. One example is the "free" right-turn movement. A common occurrence on many arterials, this practice should be avoided in areas of high pedestrian activity due to conflicts created by high speed right-turning vehicles and the potential for motorists to not observe or yield to crossing pedestrians. Vehicles using anything less restrictive than a stop condition at streets bisecting at 90 degrees are likely to enter the bisecting roadway with less visibility and reaction time. The unintended message to the driver is one of roadway prominence and does not caution the driver that pedestrians may be present.



Free right ingress and egress at East Avenue and University Boulevard intersection is uninviting to pedestrians and over-designed for vehicles.

Westfield's entrance on University Boulevard at East Avenue, shown here, is an example. Traffic moving into and out of the site has little need to slow down or stop, yield signs and crosswalks were observed to have little effect on driver behavior.

Another intersection and driveway design issue is the size of curb radii for truck access. In suburban areas, all entrances may be designed for truck access and result in larger turn radii. Larger turn radii increase the speeds of right-turning vehicles and increase the crossing distance for pedestrians. To promote pedestrian comfort and safety, a single truck access should be designed that allows trucks to enter and exit the site where the fewest pedestrian conflicts occur. The curb radii at the remaining non-truck access points should be reduced to lower vehicle turning speeds and reduce the crossing distance for pedestrians.

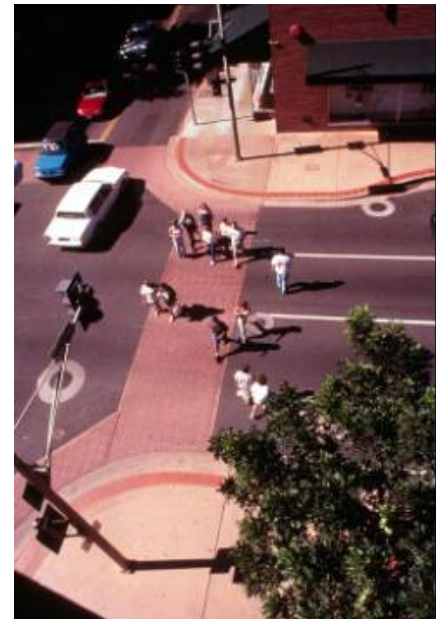
The Westfield entrance at Reddie Drive and Veirs Mill Road is designed for truck access at a location where pedestrian activity is also oriented from the Wheaton Triangle to the Metro garage and shopping mall access. Reducing the radius of this intersection would permit a better crosswalk design, perpendicular to the street with less time for the pedestrian in the travel lanes.

Intersections should always be designed as close to 90 degrees as possible. Signs and pavement markings should be well maintained and highly visible. Marked crosswalks should be located at the shortest crossing point with the greatest pedestrian visibility. Textured pavements should be considered, if feasible, to better delineate pedestrian paths and spaces. In streets with curbside parking, curb extensions increase visibility for both pedestrians and vehicles. The corner is typically not permitted for parking, so while capacity may be somewhat reduced, decisions should favor greater pedestrian safety.

University Boulevard at Veirs Mill Road and at Elkin Street both present skewed intersections particularly uncomfortable for the mix of pedestrians and vehicles typically present and could benefit from reduced curb radii, extended medians, enhanced pedestrian crossings and curb extensions where possible.

Driveway Design

Commercial center parking lot design has evolved during the last 50 years. In the 1980s and 1990s, adding islands for trees, landscaping and better vehicle channelization was emphasized to improve aesthetics. Today the transition to pedestrian-friendly commercial centers requires that the organization and placement of parking quadrants begin to build a street grid that is easily navigated by the pedestrian and sets up the site for urban style infill. Connections from community streets into the site, circulation within the site between uses, and the orientation of buildings and their entrances for pedestrian use are some of the basic requirements of good site design.



Curb extensions and a clearly marked crosswalk support crossing safety. Photo by Dan Burden



Pedestrians are frequent visitors to the Westfield property's circulator road moving between the new Giant Food Store, a bank and Starbucks and the office tower.

Sidewalk planned through the Westfield site does not follow the most direct route between destinations. Pedestrians frequently use the generous road and parking system, designed to optimize vehicle circulation and access.

Pedestrian Communication

Pedestrian communications systems for using the transportation networks are increasingly important when adding and mixing modes. Improvements in these areas range from better understanding of walk cycles at intersections and enhanced real time transit information to Accessible Pedestrian Signals for visually impaired pedestrians. The use of countdown signals, push buttons with directional arrows, audible signals, and operational tools such as pedestrian signal phasing, are encouraged and should be consistent throughout the area. Enhanced transit information including up-to-date schedules, legible route and area mapping, and real time arrival and departure information at key stops not only improve user understanding, but can also improve ridership.

The County will install countdown signals throughout Wheaton as a result of the success of the Georgia Avenue at Reedie Drive pilot.



Call button for pedestrian phase with directional arrow.

Transit Stop Location & Amenity

Availability of transit is an important feature of urban life and particularly useful as an alternative to those who cannot or do not drive. They deserve special attention not only to improve pedestrian safety and encourage transit use by choice riders, but to enhance the quality of the urban environment.

Bus Stop Location

Property owner resistance and available right-of-way is just the beginning of the challenge transit operators face when fitting safe bus stops into the typical arterial corridor. While not always available, effort must be made to place the stop at the safest location, which is generally closest to an intersection related to a destination that attracts transit users. These include regional transit service such as metro or express bus service, a cluster of office buildings, an apartment complex, or a retail or industrial employment center. Whether the stop is best placed on the near (approach) corner or the far side of the intersection often depends on the intersection's geometry, crosswalk locations, and traffic operations.



Passenger waiting at a poorly located mid-block stop along University Boulevard with little pedestrian amenity.

Nearly 500 bus shelters are being installed throughout Montgomery County during coming months. The County is also studying Bus Rapid Transit (BRT) options between Rockville and Wheaton, and will address the placement of BRT shelters. This offers a unique opportunity to locate transit stop locations for greatest passenger convenience and safety. Other opportunities to locate and properly size bus stops can be addressed as part of new development. The transit stop shown on University Boulevard in front of the new Giant Food Store is a candidate for possible relocation.

Bus Shelter Design

By their nature bus stops become gathering places along the street. In suburban locations good design can mean the difference between a simple sign pole and an interesting element of street architecture, helping to frame the street, provide shelter and information to users, and call out a valuable transportation asset.

Bus stops in Wheaton are a relatively low cost way to communicate the fact that Wheaton is changing. The Wheaton Redevelopment office through one of its committees should work with DPWT to initiate an effort to landscape and provide passenger amenities such as newspaper boxes, trash receptacles, attractive area maps, and real time passenger information when available. The opportunity is also available to work with the owners of these properties to create a more attractive bus stop for passengers waiting in front of their businesses.



An example of a commercial business' waiting area designed with cover, shade, and a welcoming "open for business" face to the street. Photo by Dan Burden



Two examples of bus stops located in front of commercial businesses in Wheaton. Both are opportunities for beautification and transit branding.



Vehicle Safety and Wayfinding

Structured Parking Access

Locating public parking is an important aspect of building a strong pedestrian realm. Parking access driveways from the principle arterials should be avoided in favor of smaller streets where speeds are slower and entering and existing the roadway is safer. Driveway access should be perpendicular to the roadway and located away from intersecting streets. As new structured parking is added it should be sited during the planning process so that the best locations are not lost.

The residential development east of the Wheaton Triangle along Georgia Avenue wrapped an existing parking garage with new live-work housing, dramatically improving the street environment there. This study has also recommended locating new parking in the Wheaton Triangle north of relocated Ennalls Avenue so it can be easily reached from both Georgia Avenue and Veirs Mill Road.

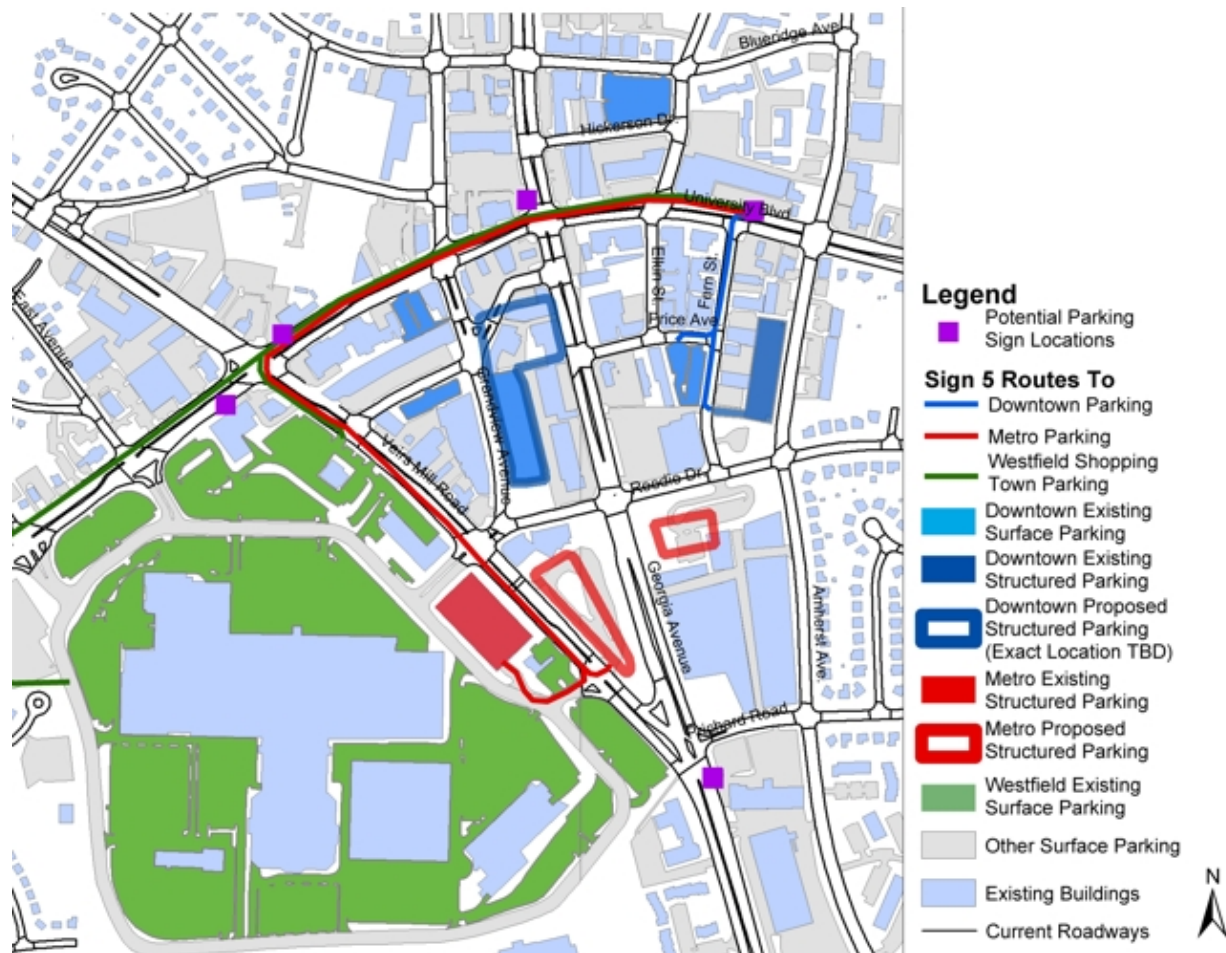
Wayfinding System

As areas become more urban, they attract visitors from outside the area who may be unfamiliar with the location of parking and major destinations. A system of coordinated signage to bring order helps indicate public parking options and orients drivers to parking opportunities off the principle arterials.

Metro has provided signs in several locations to direct drivers to its station. Coordinating this effort with the parking authority and the redevelopment office can reduce sign clutter and establish an image that ties Wheaton together.



Wayfinding signage for Metro station and parking.



Proposed shopping, metro and public garage access routes and wayfinding signage locations.

The Walking Environment

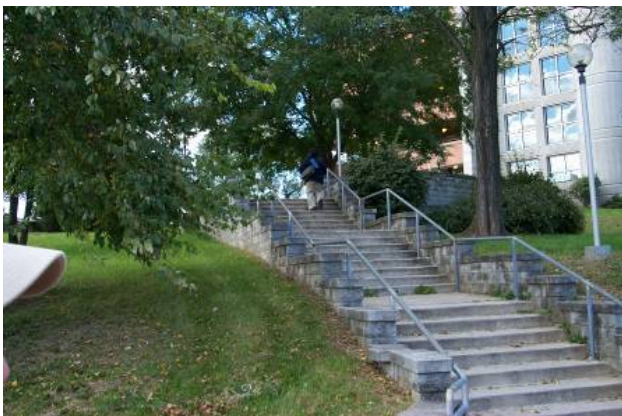
Creating streets appealing to pedestrian traffic relies on many factors beyond the curb. This study discusses the importance of built space to form the street edge. A concept for what should be accommodated in the space between the building and the roadway has been developed by the City of Portland Oregon in its Pedestrian Design Guide. The Guide describes a “sidewalk corridor”, whose width is defined by a curb zone, a planter/furniture zone, a pedestrian zone, and a frontage zone (Portland Pedestrian Design Guide, 1998). Bethesda and Silver Spring offer local urban examples, demonstrating that a 5-foot sidewalk is generally insufficient to meet the needs of urbanizing suburban districts.



This residential zone in Portland Oregon's Pearl District provides a generous building frontage zone with strong features to distinguish the public from the private

Public Space

Inviting public spaces in a downtown add a great deal to the pedestrian environment. They can provide gathering and civic space, create community landmarks that distinguish one place from another, and have the potential to attract commerce. Few suburban environments have been intentional in creating good public space, but rather include open space often from land that which has the least development potential. Even with the best of intentions, the public and open space does not always work to bring people together. Its success is generally a combination of location along a logical path and attractions that draw people to it. This fountain in Bethesda, created as part of the public art component of a commercial development, is an example of a very memorable and desirable public space.



This recent staircase addition to the park in Wheaton is seen as a barrier at the street edge.



Downtown Bethesda's street plaza is a popular meeting place and local landmark.

Parking Access Design

A walking path interrupted for auto access to parking creates a conflict point between vehicles and pedestrians on the sidewalk. As the driver exits the roadway to enter a driveway, the driver must yield to pedestrians on the sidewalk. Eliminating ingress and egress lanes and narrowing the driveway opening to encourage lower entering speeds are important aspects of transforming the auto-oriented strip into a safe pedestrian environment. Materials and minor grade differences can also be used to reinforce to the driver that he has entered a pedestrian space.



This Wheaton driveway offers an overly generous apron width to entering vehicles and little distinction between pedestrian and auto spaces.



A downtown Bethesda example of barrier and texture elements providing strong definition to distinguish pedestrian priority across a driveway.

Streetscape

Landscape architects think of a streetscape as an outdoor room, inviting to people and vital to a vibrant downtown. Its sidewalk provides a generous pedestrian path with edges framing the walking space, providing shade and cover, and keeping pedestrians at a comfortable distance from faster moving automobile traffic, often provided by a row of parked cars.



Use of the space between the building façade and Veirs Mill Road is designed for parking and parking access.



This streetscape in Bethesda provides space for public and restaurant seating, bicycle parking, landscaping and parking meters.

Downtown Bethesda's streetscape, shown in the right photo on the previous page, includes a wide buffer for benches, bicycle parking and outdoor dining, all contributing to a welcoming commercial street. Removing parking to the curb and reconstructing the parking area for pedestrians in the Wheaton example, pictured on the previous page left, would dramatically change the character and pedestrian feel of the sidewalk.

Clear Path

A fundamental characteristic of the walking environment is a clear unobstructed pedestrian path for pedestrians. SHA has made significant progress in recent years to add sidewalk along roadway sections with transit and commercial activity. Many maintenance and system preservation projects include the provision for moving utility and signal poles blocking clear passage along the roadway. Rather than relying on an ADA definition of a clear path, the opportunity exists to inform sidewalk width decisions based on the type of pedestrian area expected or planned. In urbanizing areas, where new buildings are to be located at the street edge, sidewalk width should consider higher volumes of pedestrians and a broader range of sidewalk activity.

Inadequate sidewalk width and sidewalk obstructions occur in many parts of the Wheaton CBD. The example of a narrow passage in the example below is a particular safety concern particularly for the disabled or visually impaired due to its proximity to moving traffic and the steep grade.



Veirs Mill Road sidewalk next to a part time travel lane offers a minimum clear path for pedestrians walking single file.



This "clear path" is covered and offers amenities to pedestrians including a buffer from traffic with landscaping and curbside parking

The next section provides recommendations and the some of the tools available to include these concepts in future improvements specific to Wheaton. Many of the same tools and similar agency functions are available in other jurisdictions under different names.

RECOMMENDATIONS

The recommendations that follow are organized according to general ease of implementation due to agency control. They are not presented in any priority order. While these recommendations have received general support as a part of an overall approach, they have not been made formal up to this point, nor is funding for plans and projects in any way implied by agency endorsements. The recommendations are presented solely to help guide actions, so that future decisions, at a minimum, do not preclude the ability to advance them at a future date.

Administrative & Operating Procedures

Provide Automatic Pedestrian Recall Phasing

Intersections in the Wheaton CBD, especially the Marketplace Triangle area should be considered for automatic pedestrian recall phasing at all legal pedestrian crossings to standardize pedestrian priority in the CBD. The current system is a mix of automatic and manual recall phasing.

Continue Pilot Program of Accessible Pedestrian Devices

Accessible pedestrian devices and other pedestrian treatments, including adding pedestals for push buttons and pedestrian signal heads, reconstructing curb ramps, placing RTOR restrictions, modifying sign placements to improve visibility, and adding pedestrian activated crossing signs should be considered and adopted where appropriate.

Plans & Guidelines

Update Wheaton Streetscape Guidelines

The Wheaton Streetscape Guidelines prepared by the Montgomery County Department of Housing and Community Affairs should be updated to clarify functional intention of designs and to broaden the scope of streetscape items as follows:

Streetscape Functional Design

Address directional orientation for crosswalk, clear zone, clear pathway, street furniture, buffer, trees on curbside of sidewalk, and be referenced in corresponding roadway design documents.

Coordinated review of the Standards with permit agencies

Prescribed features of the pedestrian realm including driveway width and spacing, bus stop placement, and various stop type characteristics should be coordinated with review offices to be included in the range of potential developer improvements.

Stop Location

Add a section to address bus stop and shelter location at intersections and marked crossings, standard shelter design including area maps, up-to-date schedules and real time arrival and departure information and space for rider amenities such as benches, trash receptacles and newspaper boxes.

Update Transportation Facility Guiding Documents

County Road Code and DPWT Design Standards Revision

Ensure these documents enhance pedestrian safety and establish standards for lane width, median width, curb radii, landscaping, bike lanes, street lighting, sidewalks in areas of high pedestrian activity, including school, employment, commercial and transit areas.

General Plan Revision

The County's Master Plan of Highways is based on the cumulative visions set out in each of the County's sector plans. To avoid gaps in guidance, the sector planning process can help to inform the larger policy framework that should be periodically updated to reflect changing priorities County-wide.

Provide Best Practices Guide for SHA

A compendium of best practices is recommended to enhance consistency in planning, access and design processes and decisions, to create a working definition of urban/transit environments, to establish internal policy for lane width, median width, pavement markings, intersection spacing, curb radii, landscaping treatment, bike lanes, street lighting, and sidewalk characteristics in pedestrian oriented areas. This could include recent work in ADA and bicycle guidance, and include current administrative practices to bring guidance together in one document.

Prepare a Wayfinding Plan

Metrorail wayfinding should be jointly coordinated in Wheaton CBD to include direction to travelers toward public parking facilities and other civic destinations.

Expand Pedestrian Impact Analysis and Guidelines

Consolidate and expand the innovative concept of Pedestrian Impact Analysis guidelines to be more prescriptive and more widely used statewide. All projects should address pedestrian safety links along desire lines, between generators, and promote shortest travel distances. Guidance for site plan review should include elements such as building entrance, sidewalk width (6' min), vehicle conflicts, and characteristics of adjacent roadway, building orientation, and pedestrian enhancing façade design.

Update Wheaton Sector Plan

The following elements of the Wheaton Sector Plan are offered as items for revision during the next update to promote an active pedestrian environment in the CBD.

Road Network

Traffic and roadway elements of the Plan assume that Wheaton is the end of the Metrorail Red Line for the duration of the Plan. This prioritizes station access for commuters arriving by car and focuses transportation improvements on capacity rather than internal circulation and access. Glenmont Station, completed in 1998, attracts traffic coming from points north of Glenmont.

Pedestrian Network

The pedestrian plan details sidewalk and land use features to increase the comfort of the pedestrian realm, specifically improving Georgia Avenue, University Boulevard, Reddie Drive and Ennalls Avenue with "wider sidewalks, landscaping, street furniture and [possible] street narrowing". The work of this study recognizes the opportunity that Westfield Shoppingtown adds to the mixed-use quality of downtown Wheaton, especially as it is an important pedestrian draw. Including Veirs Mill Road, the Mall circulator

road and access at Ennalls Avenue into an urban grid would help to improve both pedestrian and vehicular circulation laying out a more complete urban framework. Beginning this grid at Prichard Drive is also important to define an entry point before arriving at the station.

CBD Boundaries

Including the Westfield property in the Urban District would recognize its contribution to Wheaton's commercial and public attraction critical mass. From the pedestrian perspective it would enable a change of its infrastructure to support the commercial street concept for the mall driveway and Ennalls Avenue access drive. These links would be designed to function as part of the overall grid, built according to street standards with a building orientation to streets rather than to parking lots.

Pedestrian Facilities

While the plan places strong emphasis on the pedestrian realm it also suggests the addition of possible bridge structures for added pedestrian crossing safety. Because residential neighborhoods are important pedestrian generators, Wheaton roads continue to attract pedestrians at grade. Any plan revision should offer guidance for key crossing points and indicate appropriate pedestrian treatments for crossing safety. Pedestrian bridges should be a last resort as they are typically used only by those who find them convenient from where their trip originates or ends at one end or the other of the crossing. An over-crossing can give a false impression to the motorist that pedestrians should not and will not be at the street level. Whether or not grade-separated crossings are included, all Wheaton intersections should be considered as the primary pedestrian route and designed for safe pedestrian crossing.

Redevelopment Incentives

The plan establishes the concept of a Retail Preservation Overlay specifically designed to preserve the Wheaton Marketplace in the triangle east of Georgia Avenue and north of University Boulevard. While the area should continue to maintain strong street-level retail activity supporting an active pedestrian realm, the strip commercial design of many properties is not providing a pedestrian-friendly urban place. Any plan revision would likely revisit the success of this overlay to increase rehabilitation and redevelopment incentives to produce much of what the current plan describes.

Parking Location

Public parking locations should be targeted in the plan to reduce roadway crossing barriers between existing parking and potential destinations guiding future garage adequacy for each quadrant of the overall commercial area. Access should be directed to secondary roads and away from intersections

Transit Oriented Development Guidance

This recommendation is presented as a general concept as much of Wheaton Metro is designed or developed today. A local vision should be provided to guide WMATA review of site development in advance of responder plans to ensure community vetted ideas in advance of WMATA site solicitation. Specific parameters, ideas and goals will reduce reliance on the agency discretion to bring about related infrastructure improvements and potentially streamline developer plans.

Site Design Guidelines

Orient access points of new development along State highways to intersections and the pedestrian overpass to improve the positive guidance to pedestrians to cross at signalized intersections or through overcrossings.

Evaluate Fee-In-Lieu of On-Site Parking Policies

To ensure that parking fee reserves are adequate to address future demand, consider modifying the parking tax to a quantified estimate of parking demand, rather than tied to assessed property value.

Introduce a Statewide Suburban Center Pedestrian Safety Program

Provide support to local jurisdictions to improve planning and development decisions related to pedestrian safety in suburban centers. Using the process outlined in this study, promote awareness and action in subdivisions facing growing transit and pedestrian activity.

Maintenance & Preservation

Provide Consistent & More Visible Crossing Details

Crosswalk markings should be provided at all intersections and in-sign pedestrian actuated lighting should be considered as a pilot to increase driver awareness of pedestrian crossings. A more frequent schedule to maintain worn crosswalks and use of the ladder crossing should be considered to reduce the need for maintenance frequency and heighten crosswalk visibility.

Install Countdown Pedestrian Timers

Continue DPWT's pilot project from Georgia Avenue and Veirs Mill Road pedestrian crossings to similar areas as statewide funding permits.

Lift Parking Restrictions on Veirs Mill Road

The area on the northwest direction of Veirs Mill Road between the Wheaton Station Metro Access and Ennalls Avenue should be gradually considered for a phased lifting of parking restrictions and the addition of curb extensions at intersections. Current business along much of the street is incompatible with curbside parking, but over time as businesses redevelop, a view to creating a wider sidewalk with pedestrian friendly building frontage should allow this lane to be available for full time parking and reduced pedestrian crossing distances at intersections.

Relocate/upgrade Bus Stops and Shelters

In coming months 500 new shelters will be replaced or added to the County's network by DPWT staff. Working closely with traffic and highway engineers will be an important part obtaining related road and intersection improvements and locating shelters adjacent to marked crossings with good motorist visibility.

Capital Projects

Extend Ennalls Avenue into the Westfield Circulator Road

Connect Veirs Mill Road to Westfield Shoppingtown Circulator Road and install traffic signal and striped crosswalks at the Veirs Mill Road intersection to bring order to an area dangerous for pedestrians. The curb radii into Ennalls Avenue should be reduced to slow turning vehicles and provide a shorter crossing distance for pedestrians. This has the potential to better serve retail at that location by providing improved northbound and eastbound access. It would also support residential development that could occur internal to the Westfield site in the event that Westfield's management moves in that direction.

Relocate Ennalls Avenue on Georgia Avenue

Connect Grandview Avenue to Georgia Avenue at Price Avenue on a relocated Ennalls Avenue alignment, installing a traffic signal and marked crossing for pedestrians.

Realign Veirs Mill Road Approach to Georgia Avenue

Realign the Veirs Mill Road to create a better crossing angle, modifying the traffic signal and install crosswalks through joint SHA's Crash Prevention Program and Westfield development improvements or other program.

Education & Enforcement

Reinforce Safe Behavior in Traffic

Organize on-site friendly "sting" operations to change pedestrian and vehicle behavior, increase vehicle awareness of pedestrian right-of-way, and reduce illegal pedestrian crossing activity.

Parking Enforcement

Enforce parking violations including employees meter feeding in short term parking areas.

Manage Parking Demand

Increase transit use through employer incentive programs and other transportation demand management approaches.

RESOURCE INTERVIEWS AND MEETINGS

Date	Organization	Participants
August 2003	Mid-County Services Center & Wheaton Redevelopment Office	Natalie Cantor , Director Mid-County Services Center Doug Wrenn , Urban Redevelopment Program Director
September 2003	Montgomery County DPWT and SHA District 3 Staff	Emil Wolanin , DPWT, Chief of Traffic Engineering and Operations Bruce Mangum , Traffic Operations Jeff Riese , Traffic Operations Barbara Barker , Parking Operations Sarah Navid , Permit Services Lori Gillen , County Exec office Dennis Ingram , District 3 Project Support Team Stephanie Yanovitz , District 3 Traffic Engineer
	Joint Wheaton Urban District Advisory Committee & Wheaton Redevelopment Committee	Members of Both Committees Montgomery County & MNCPPC Staff
	MNCPPC Planning Staff	Larry Cole , Highway Coordinator Khalid Afzal , City Planner
October 2003	Wheaton Urban Design Subcommittee	Committee Members & Redevelopment Office Staff
	Access Permits Meeting	Ken McDonald , Division Chief Greg Cook , Regional Supervisor Montgomery County Engineering Access Permits
	Westfield Shoppingtown	Anthony Alessi , Development Director
	SHA District 3	Lee Starkloff , Assistant District Engineer Stephanie Yanovitz , District 3 Traffic Engineer Dennis Ingram , District 3 Project Support Team Greg Cook , Regional Supervisor Montgomery County Engineering Access Permits
	Pedestrian Study Steering Committee (Field Survey)	Members & Staff
November 2003	Bozzuto Group	Artie Harris , Vice President
	Montgomery County Council	Glenn Orlin , Council Aid
	Urban Design Subcommittee	Committee Members & Redevelopment Office Staff
	Wheaton Citizen's Coalition	Community members
	WMATA Joint Development	Dan Hertz , Development Specialist
December 2003	MCDPWT Parking Operations	Barbara Barker , Senior Planning Specialist
	MC Dept Housing & Community Affairs	Bob Fischer , Montgomery County Dept. Housing
	MNCPPC Transportation Planning	Ron Welke , Transportation Planning

February 2004	Pedestrian Study Steering Committee	Members and Staff
	SHA Regional Planning	Dennis Simpson , Planning Manager Mike Haley , Planning Manager
March 2004	Montgomery County DPWT Director	Al Genetti , Director
	Montgomery County Executive	Doug Duncan , County Executive Al Genetti , Director Natalie Cantor , Director Mid-County Services Center
May 2004	MNCPPC	Planning Board & Public
June 2004	Montgomery County DPWT Transit	Jeff Dunkel , DPWT Gary Erenrich , DPWT Rob Klein , DPWT
September 2004	SHA Office of Traffic & Safety	Tom Hicks , Director, Office of Traffic and Safety
	SHA Deputy Administrator	Doug Simmons , Deputy Administrator/Chief Engineer for Planning and Engineering Raja Veeramachaneni , Planning Director Dennis German , Community Design Division Chief Eric Tabacek , Traffic Research Division Chief
	SHA Administrator	Neil Pedersen , Administrator Tom Hicks , Director, Office of Traffic and Safety Charlie Watkins , District Engineer Steve Foster , Access Permits Division Chief Greg Cook , Regional Supervisor Montgomery County Engineering Access Permits

WHEATON GUIDING DOCUMENTS

Bronrott, William A. (Delegate). “Montgomery County Blue Ribbon Panel on Pedestrian and Traffic Safety – Final Report.” January 2002.

Department of Housing and Community Affairs Commercial Revitalization Section. “Wheaton Commercial Area Streetscape Standards.” Revised 2002.

“Kensington-Wheaton Communities Master Plan – Chapter Five Transportation and Mobility Plan.” 1989.

M-NCPPC. “Comprehensive Amendment to the Sector Plan for the Wheaton Central Business District and Vicinity.” September 1990.

M-NCPPC. “Local Area Transportation Review Guidelines.” July 2002.

Montgomery County Application for a Grant Under the Smart Growth Transit Program. “Pedestrian Safety Toolbox Implementation.” August 2002.

Rivkin, Malcom D. “Transit-Oriented Development Criteria: A Framework for Screening Station Area Proposals.” December 2002.

TECHNICAL RESOURCES

City of Portland Office of Transportation Engineering and Development Pedestrian Transportation Program. “Portland Pedestrian Design Guide.” June 1998.

Georgia Department of Transportation. “Statewide Bicycle and Pedestrian Initiative: Pedestrian & Streetscape Guide.” January 2004.

Maryland Department of Transportation Office of Highway Development. “Accessibility Guidelines for Pedestrian Facilities Along State Highways.” November 2002.

US Department of Transportation Federal Highway Administration. “Designing Sidewalks and Trails for Access – Part I of II: Review of Existing Guidelines and Practices.” July 1999.



State of Florida Department of Transportation. “Florida Pedestrian Planning and Design Handbook.” April 1999.

US Department of Transportation Federal Highway Administration. “Designing Sidewalks and Trails for Access – Part II or II: Best Practices Design Guide.”

Goal 1: Support Logical Pathways, Key Connections and Safe Crossings

Element	Roadway	Section Location	Existing Conditions: Issues & Opportunities	Photo
1.1 <i>Intersection Design and Signal Phasing</i>	Georgia Avenue	At Veirs Mill Road and Pritchard Road	<ul style="list-style-type: none"> • Veirs Mill Road at Georgia Avenue and Pritchard Road is the most direct route for neighborhoods east of Georgia Avenue to Westfield shopping mall and Metro's transit center on the west side • Intersection will become more important with the completion of residential development occurring north of Pritchard Road • Confusing intersection for pedestrians due to unusual geometry and channelization • Lack of pedestrian crossing markings and continuous northbound traffic flow make this an undesirable location to cross • Gaps in northbound traffic are created by signals south of the intersection 	 
			<ul style="list-style-type: none"> • The Reedie Drive crossing of Georgia Avenue is a primary pedestrian route • Provides direct link to grocery store, park, residential areas, and transit center • At grade crosswalk duplicates Metro pedestrian tunnel linking Kiss & Ride and bus drop off • The Metro pedestrian tunnel offers an opportunity to avoid the street crossing but is oriented to the parking lot rather than the street • Site of countdown signal pilot 	 

Goal 1: Support Logical Pathways, Key Connections and Safe Crossings

<i>Element</i>	<i>Roadway</i>	<i>Section Location</i>	<i>Existing Conditions: Issues & Opportunities</i>	<i>Photo</i>
1.3 Internal site circulation/ Midblock Crossing	Georgia Avenue	North of Reedie Drive (Safeway)	<ul style="list-style-type: none">• Undesignated pedestrian connection along the north side of Safeway through the parking lot to the bus shelter on Georgia Avenue• Midblock crossing from Safeway to Marketplace• Attractive landscaped medians provided on all approaches; nose is not wide enough to provide pedestrian refuge	 



Goal 1: Support Logical Pathways, Key Connections and Safe Crossings

Element	Roadway	Section Location	Existing Conditions: Issues & Opportunities	Photo
1.4 Internal Site Circulation	Fern Street	At Reddie Drive	<ul style="list-style-type: none">The Parking Garage on east side of Fern Street might be better utilized if the pedestrian connection was strengthened (lighting, sidewalk, street edge, etc.)Crossing treatments are provided at Reddie but not the most direct route for points north on GeorgiaRedevelopment of Safeway should create a formal attractive mid-block link	 
1.5 Internal Site Circulation	Triangle Lane	Grandview Avenue Area	<ul style="list-style-type: none">The pedestrian connections from the east side of Georgia Avenue to the businesses north of Reddie and within the Triangle Lane courtyard require use of alleys or indirect routes	




Goal 1: Support Logical Pathways, Key Connections and Safe Crossings

<i>Element</i>	<i>Roadway</i>	<i>Section Location</i>	<i>Existing Conditions: Issues & Opportunities</i>	<i>Photo</i>
1.6 Crossing Safety	University Boulevard	At Amherst Avenue	<ul style="list-style-type: none">• Amherst is a logical path because of the smaller street cross section, residential character, low vehicular volumes, and slow vehicular speeds• Key link for students between residential areas and the school and library north of University Boulevard• Mid-block crossing present	
1.7 Crossing Safety	Georgia Avenue	At Hickerson Avenue	<ul style="list-style-type: none">• No striping or refuge is provided for pedestrian crossings at this unsignalized intersection	
1.8 Intersection Design	University Boulevard	At Elkin Avenue	<ul style="list-style-type: none">• The location of the crosswalk on the northbound approach is set back from the intersection• On-street parking along University Boulevard limits driver vision of pedestrians in crosswalk.• Right-turning vehicles may not see pedestrians until already initiating right-turn	

Goal 1: Support Logical Pathways, Key Connections and Safe Crossings

<i>Element</i>	<i>Roadway</i>	<i>Section Location</i>	<i>Existing Conditions: Issues & Opportunities</i>	<i>Photo</i>
1.9 Midblock crossing	Veirs Mill Road Corridor	Georgia Avenue to Reddie Drive	<ul style="list-style-type: none">• Transit riders cross Veirs Mill Road at street level and do not use pedestrian overpass• Pedestrian access for bus drop-off is located at midblock and directly across from sidewalk next to the Metro parking garage and well-used ride-on bus stop on the Ring Road• High vehicles speeds from Georgia Avenue intersection to active pedestrian link adjacent to bus and Metro transfer point	 



Goal 1: Support Logical Pathways, Key Connections and Safe Crossings

Element	Roadway	Section Location	Existing Conditions: Issues & Opportunities	Photo
1.10 Intersection Design	Veirs Mill Road	At Reddie Drive	<ul style="list-style-type: none">• Crosswalk pushbutton is off-center in the northwest corner of the intersection• Northwest corner is wide resulting in high turning speeds and non-perpendicular crosswalk	
1.11 Midblock crossing	Veirs Mill Road	At Ennalls Avenue	<ul style="list-style-type: none">• Pedestrians alighting from the bus stop walk midblock across Veirs Mill Road to the covered sidewalk next to building fronts• Wide, busy, unsignalized and unmarked intersection not desirable for pedestrians	
1.12 Intersection Design	University Boulevard	Westfield Eastern Entrance	<ul style="list-style-type: none">• Right-in/right-out curb radii results in high vehicle speeds and motorists not yielding to pedestrians• Indirect pedestrian path with poor refuge environment	



Goal 1: Support Logical Pathways, Key Connections and Safe Crossings

<i>Element</i>	<i>Roadway</i>	<i>Section Location</i>	<i>Existing Conditions: Issues & Opportunities</i>	<i>Photo</i>
1.13 Internal Site Circulation	Westfield Shoppingtown	Ring Road	<ul style="list-style-type: none">Natural walking connections between retail uses and offices should be reinforced in the new pedestrian circulation design	
1.14 Intersection Design	University Blvd	Grandview Avenue	<ul style="list-style-type: none">Lack of site distance for crossing pedestrians due to parked cars and grade drop from west approach.Queing through the intersection during peak hours blocking vehicular and pedestrian passage.	 


Goal 1: Support Logical Pathways, Key Connections and Safe Crossings

<i>Element</i>	<i>Roadway</i>	<i>Section Location</i>	<i>Existing Conditions: Issues & Opportunities</i>	<i>Photo</i>
1.15 Crossing Hardware	Georgia Avenue	Blueridge Avenue	<ul style="list-style-type: none">• Pedestrian crossing buttons lack directional indication decreasing pedestrian expectation	
1/15 Crossing Hardware	Georgia Avenue	Reedie Drive	<ul style="list-style-type: none">• Pilot countdown signal increases real time information to crossing pedestrians	

Goal 2: Enhance Transit Stop Location and Amenity

Element	Roadway	Section Location	Existing Conditions: Issues & Opportunities	Photo
2.1 Amenity	Georgia Avenue	University Boulevard to Veirs Mill Road Corridor	<ul style="list-style-type: none">• Bus stops are poorly marked and lack orientation maps• Improved signage is necessary; sign height is too high, seemingly oriented for the bus driver rather than the transit rider• Consistent stop amenities could do more to reinforce transit presence and service identification for riders• Size and space for riders may be inconsistent with need	
2.2 Orientation to Crosswalks	Georgia Avenue	North of Reddie Drive at Safeway	<ul style="list-style-type: none">• Shelter area could be more integrated into the sidewalk area rather than set in a parking lot• Mid-block pedestrian crossing activity on Georgia Avenue	 <p>Looking North on Georgia Avenue</p>

Goal 2: Enhance Transit Stop Location and Amenity

Element	Roadway	Section Location	Existing Conditions: Issues & Opportunities	Photo
2.3 Orientation to Crosswalks	Veirs Mill Road	At Ennalls Avenue	<ul style="list-style-type: none">• Southbound Veirs Mill bus stop attracts and generates pedestrians; located just north of an unsignalized pedestrian crossing that does not provide a marked pedestrian crossing• Intersection geometry and lack of crosswalk/median refuge does not invite pedestrians to this intersection	 <p>Shoney's Parking entrance to Ennalls</p>
2.4 Amenity	Veirs Mill Road	At Ennalls Avenue Intersection	<ul style="list-style-type: none">• Bench and roof provided at the northbound Veirs Mill bus stop• Opportunity for a more attractive gateway to transit with building ornamentation• Greater sense of security if the shop front and its indoor lighting are oriented to this street in addition to its parking lot around the corner	 <p>Veirs Mill Bus Stop</p>
2.5 Orientation to Crosswalk	University Boulevard	At Midvale Road	<ul style="list-style-type: none">• Bus stop locations on eastbound and westbound University Boulevard at Midvale Road attract pedestrians• The unsignalized intersection does not provide a marked pedestrian crossing	




Goal 3: Improve Vehicle Safety and Wayfinding

<i>Element</i>	<i>Roadway</i>	<i>Section Location</i>	<i>Existing Conditions: Issues & Opportunities</i>	<i>Photo</i>
<i>3.1 Sight Distance and Visibility</i>	Georgia Avenue	At Ennalls Avenue	<ul style="list-style-type: none">• Limited sight distance for eastbound and northbound left-turns• Unsignalized left-turns could be restricted during peak hours of the day	
<i>3.2 Congestion/Vehicle Safety</i>	University Boulevard	At Georgia Avenue	<ul style="list-style-type: none">• Access to parking located directly off University Boulevard and east of Georgia Avenue increases conflicts with through vehicles	
<i>3.3 Congestion</i>	University Boulevard	Elkin Avenue	<ul style="list-style-type: none">• Eastbound left-turning traffic blocks through traffic; requires storage lane	



Goal 3: Improve Vehicle Safety and Wayfinding

Element	Roadway	Section Location	Existing Conditions: Issues & Opportunities	Photo
3.4 Speed and Vehicle Behavior	Veirs Mill Road	Reedie Drive	<ul style="list-style-type: none">The receiving lanes on eastbound Reedie Drive are wide and un-marked creating confusion for drivers. Striping should be used to direct vehicles into correct lanes	 <p>Looking NW to Reedie Drive and Grandview Avenue Intersection</p>
3.5 Sight Distance and Visibility	Amherst Avenue	Blueridge Avenue	<ul style="list-style-type: none">Lack of control for northbound/southbound traffic limits ability for pedestrians to cross Amherst Avenue; vehicles usually don't yield to pedestrians	
3.6 Congestion/ Sight Distance and Visibility	Georgia Avenue	Blueridge Avenue	<ul style="list-style-type: none">Wheaton Shopping driveway access located 15 feet east of intersection in the southeast cornerExiting the parking lot and traveling westbound is difficult.Site traffic may block eastbound Blueridge Avenue vehicles	




Goal 3: Improve Vehicle Safety and Wayfinding

Element	Roadway	Section Location	Existing Conditions: Issues & Opportunities	Photo
3.7 Speed and Vehicle Behavior	Georgia Avenue	Blueridge Avenue	<ul style="list-style-type: none"> Improved signing and striping on the eastbound approach would improve safety of the dual left-turn lanes Drivers may not realize that the left-lane must turn left Striping may guide vehicles into the correct receiving lanes 	
3.8 Congestion	University Boulevard	Georgia to Veirs Mill Road	<ul style="list-style-type: none"> Long queues between Georgia and Veirs Mill 	
3.9 Wayfinding/	University Boulevard	East Avenue	<ul style="list-style-type: none"> The right-turn slip lane from University Boulevard to the Westfield parking lot allows drivers to make the turn at high speeds Wayfinding exists for Metro Station; could integrate Metro logo on parking wayfinding to direct drivers to parking destination options 	

Goal 3: Improve Vehicle Safety and Wayfinding

Element	Roadway	Section Location	Existing Conditions: Issues & Opportunities	Photo
3.10 Sight Distance and Visibility	Veirs Mill Road	At Ennalls Avenue	<ul style="list-style-type: none">• Limited sight distance for eastbound and northbound left-turns• Unsignalized left-turns could be restricted during peak hours of the day	
3.11 Congestion	University Blvd	Grandview Avenue	<ul style="list-style-type: none">• Lack of sight distance for crossing pedestrians due to parked cars and grade drop from west approach.• Queing through the intersection during peak hours blocking vehicular and pedestrian passage.	



Goal 4: Strengthen the Walking Environment

Element	Roadway	Section Location	Existing Conditions: Issues & Opportunities	Photo
4.1 Street Edge	Georgia Avenue	University Boulevard to Veirs Mill Road Corridor	<ul style="list-style-type: none"> The west side of Georgia Avenue between Reedie Drive and Veirs Mill Road is uninviting to pedestrians due to a combination of the following: lack of building façade, grade differential between the sidewalk and transit center; and low handrail along the inside edge of the sidewalk. 	
4.2 Sidewalk Width	Georgia Avenue	University Boulevard to Veirs Mill Road Corridor	<ul style="list-style-type: none"> A set of consistent streetscape improvements is needed on this segment. Variability in sidewalk width (5' to 16') is too great. Sidewalks should be at least 10' wide along this high-volume, high-speed facility, particularly where building facades are at the back edge of the sidewalk 	
4.3 Public Space/ Orientation to Street	Reedie Drive	At Amherst Avenue	<ul style="list-style-type: none"> Reedie Drive and Amherst Avenue provide connections to the Veterans Memorial Park located in the northwest quadrant of the intersection Rather than creating a resting place at the street edge, mass and length of staircase creates a barrier to the street 	

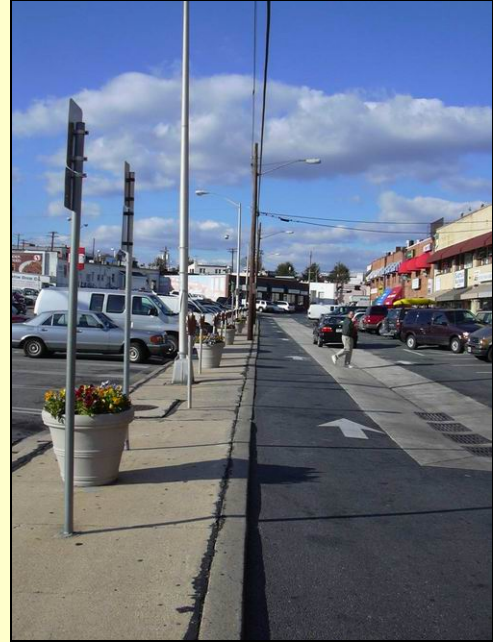
Goal 4: Strengthen the Walking Environment

Element	Roadway	Section Location	Existing Conditions: Issues & Opportunities	Photo
4.4 Pedestrian Ambiance	Georgia Avenue	University Boulevard to Veirs Mill Road Corridor	<ul style="list-style-type: none"> The lighting and banner treatment that defines downtown Wheaton links sub-districts and creates continuity but is currently incomplete 	
4.5 Street Edge/ Vehicle-Pedestrian Conflict	Veirs Mill Road	University Boulevard to Reedie Dr Corridor	<ul style="list-style-type: none"> Parking is not buffered and detracts from the pedestrian zone Driveway apron is wider than necessary giving vehicles greater ease and speed of access and reinforces auto dominance in the space 	
4.6.1 Driveway/ Parking Pedestrian Conflict	Veirs Mill Road	University Boulevard to Reedie Drive Corridor	<ul style="list-style-type: none"> Access design should minimize conflicts with pedestrians The area between the front of buildings and the street (typically the domain of the pedestrian) is shared by parking and entering/exiting vehicles 	




Goal 4: Strengthen the Walking Environment

Element	Roadway	Section Location	Existing Conditions: Issues & Opportunities	Photo
4.6.2 Driveway/ Parking Pedestrian Conflict	University Boulevard	East of Georgia Avenue	<ul style="list-style-type: none">• The area between the front of buildings and the street should be the domain of the pedestrian• Relocate Parking to street or off-site	
4.7 Building Orientation/ Setback/ Massing	Georgia Avenue	University Boulevard to Veirs Mill Road Corridor	<ul style="list-style-type: none">• Dramatic variations in built edge and massing along this short segment of the corridor. New construction is introducing multi-story residential and commercial to an area that is primarily one to two stories• Building setbacks vary, with some at the back edge of sidewalk (including the new construction), others have very narrow parking areas in front of the buildings or are set deeply on the lot, with substantial surface parking in the front	 <p>Looking North on Georgia Avenue</p>

Goal 4: Strengthen the Walking Environment

Element	Roadway	Section Location	Existing Conditions: Issues & Opportunities	Photo
4.8 Clear Path	Triangle Lane	Corridor North of Reddie Drive	<ul style="list-style-type: none">• Efforts to beautify and reduce long term parking on the west side of Triangle Lane results in obstructions (flower pots, parking meters) and reduces the pedestrian clear path• Stark, unshaded walking environment	 <p>Looking North on Triangle Lane</p>
4.9 Sidewalk Connections	Veirs Mill Road	North of University	<ul style="list-style-type: none">• Sidewalk does not connect from Wheaton north towards Rockville	


Goal 4: Strengthen the Walking Environment

Element	Roadway	Section Location	Existing Conditions: Issues & Opportunities	Photo
4.10 Sidewalk Slope	University Boulevard	At Veirs Mill Road	<ul style="list-style-type: none"> Sidewalk on the North side of University Boulevard is wide but sloping and does not meet ADA requirements 	 <p>University Boulevard Sidewalk</p>
4.11 Sidewalk/Building Orientation	Westfield Shoppingtown	Ring Road	<ul style="list-style-type: none"> Lack of building orientation to pedestrian pathways Indirect routes cause pedestrians to walk in travel lanes and through parking lots 	
4.12 Clear Sidewalk	University Boulevard	East of Veirs Mill Road	<ul style="list-style-type: none"> Street furniture, landscaping, signage and utilities should be arranged to allow a maximum clear path and where possible create a buffer between the pedestrian and the travelway 	

Goal 4: Strengthen the Walking Environment

Element	Roadway	Section Location	Existing Conditions: Issues & Opportunities	Photo
4.13 Sidewalk width/ Street Edge	Ennalls Avenue	At Grandview Avenue	<ul style="list-style-type: none"> Width of clear sidewalk varies from 9 feet to 3 feet wide between Grandview Avenue and Georgia Avenue on the south side of Ennalls Avenue Poorly executed and maintained street edge with no buffer to parked cars 	 <p>Looking West from Georgia Avenue at Sidewalk on Ennalls Avenue</p>
4.14 Sidewalks/Building Orientation/ Setback	University Boulevard	East of Georgia	<ul style="list-style-type: none"> Building setbacks vary with some at the back edge of sidewalk Inconsistent street edge treatment and sidewalk width 	
4.15 Clear Path	Veirs Mill Road (University to Reedie)	University Boulevard to Reedie	<ul style="list-style-type: none"> Parking meters, signs and other obstacles are located within the sidewalk and limit the width of useable sidewalk for pedestrians Lack of railing on steep grade next to drop off is dangerous for wheelchairs 	

Goal 4: Strengthen the Walking Environment

<i>Element</i>	<i>Roadway</i>	<i>Section Location</i>	<i>Existing Conditions: Issues & Opportunities</i>	<i>Photo</i>
<i>Above grade connections</i>	Veirs Mill Road	Metro Pedestrian Crossing	<ul style="list-style-type: none">• Use of pedestrian bridge requires strong above grade connections	



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TECHNICAL MEMORANDUM

Wheaton Metro Area Pedestrian Safety Study Traffic Operations Analysis Summary

Date: May 6, 2004

Project #: 6112.0

To: Nat Bottigheimer, MDOT

From: Brandon Nevers and Casey Bergh

cc: Yolanda Takesian, Kittelson & Associates, Inc.
Ed Strocko, MDOT
Rob Padgett, Cambridge Systematics

INTRODUCTION

Kittelson & Associates, Inc. (KAI) is preparing a study for the Maryland Department of Transportation to identify strategies and develop recommendations for improving pedestrian safety in the Wheaton Metro Area. An important component of the evaluation is identifying the impacts to non-pedestrian modes. This memorandum summarizes the traffic operational impacts associated with the transportation improvements identified as part of the Wheaton Metro Area Pedestrian Safety Study. The analysis summarized in this memorandum focuses on the State Highway routes in the Wheaton Metro Area: MD 97 (Georgia Avenue), MD 586 (Veirs Mill Road), and MD 193 (University Boulevard).

Traffic operations were evaluated for both the weekday a.m. peak hour and p.m. peak hour time periods. The study intersections include the signalized intersections in the Wheaton triangle:

- Veirs Mill Road/University Boulevard
- Veirs Mill Road/Ennalls Avenue (future conditions only)
- Veirs Mill Road/Westfield North Access-Reedie Drive
- Veirs Mill Road/Westfield South Access-Metro Access
- Veirs Mill Road/Georgia Avenue
- Georgia Avenue/University Boulevard

- Georgia Avenue/Ennalls Avenue (future conditions only)
- Georgia Avenue/Reedie Drive

Traffic operations were evaluated under three scenarios for all time periods and study intersections. The scenarios include:

- Existing conditions
- 2005 Build Traffic Conditions¹
- 2005 Build Traffic Conditions with KAI's Recommended Improvements¹

All intersections were evaluated using the Critical Lane Analysis methodology described in the Maryland-National Capital Park and Planning Commission's *Local Area Transportation Review Guidelines* (June 2002) as well as the Highway Capacity Manual methodology that is incorporated in the Synchro traffic operations software package.

Analysis Scenarios

A description of each analysis scenario is provided in the following sections.

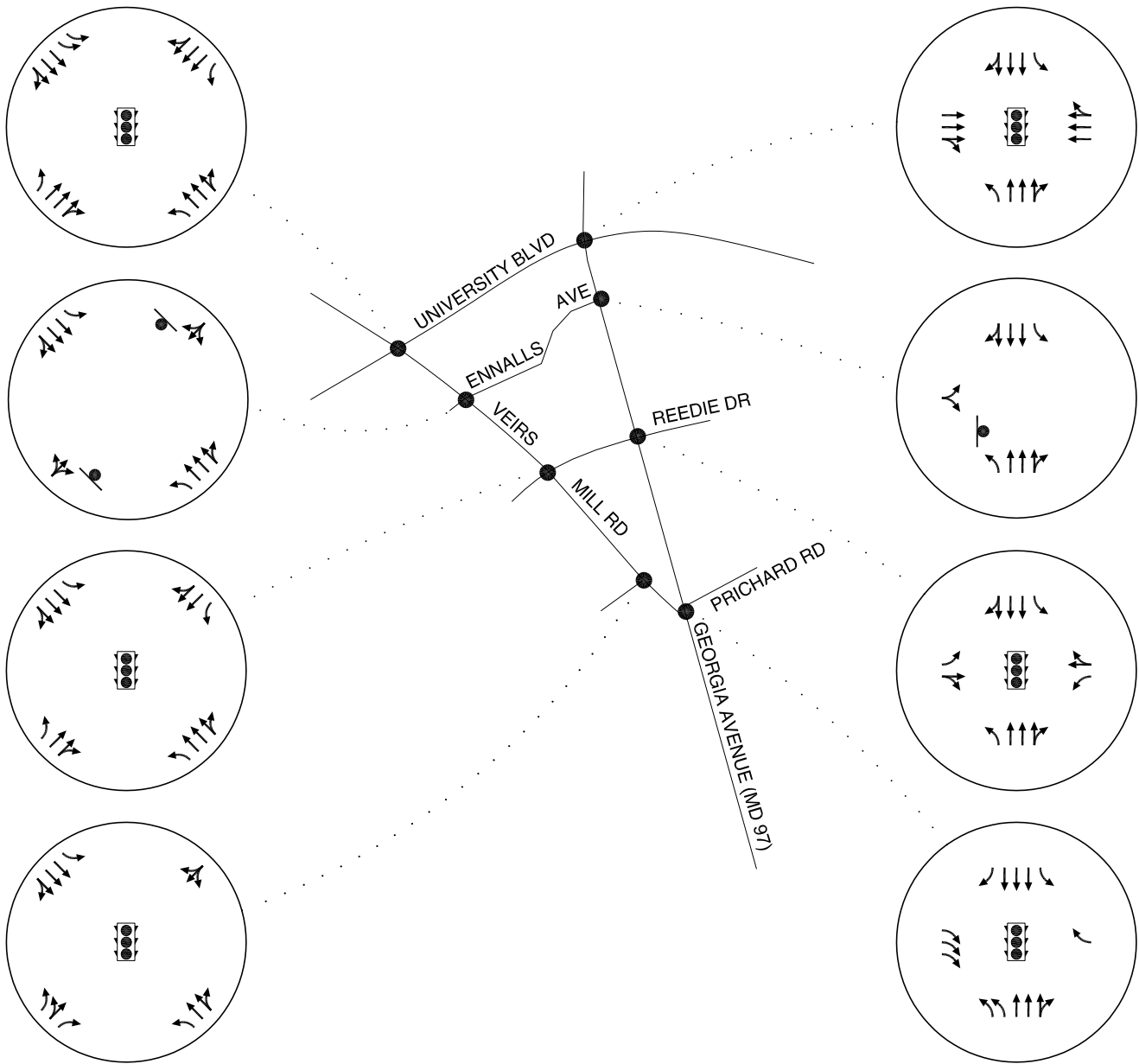
Existing Traffic Conditions

Figure 1 illustrates the existing lane configurations and traffic control devices at the study intersections. As shown in Figure 1, Georgia Avenue maintains three through lanes in each direction within the Wheaton Triangle. Veirs Mill Road has two lanes north of Georgia Avenue in the northbound direction, then widens to three lanes beyond the Metro South Access traffic signal. Veirs Mill Road has three through lanes in the southbound direction.

Existing turning movement volumes were obtained from Montgomery County and SHA. Those intersection turning movement volumes were collected between 2000 and 2002. The intersection volumes were balanced to match recent 24-hour bi-directional link counts conducted by SHA on Georgia Avenue, Veirs Mill Road, and University Boulevard. Figure 2 summarizes the peak hour directional traffic volumes and average daily traffic volumes based on tube counts conducted by SHA in February and March 2003.

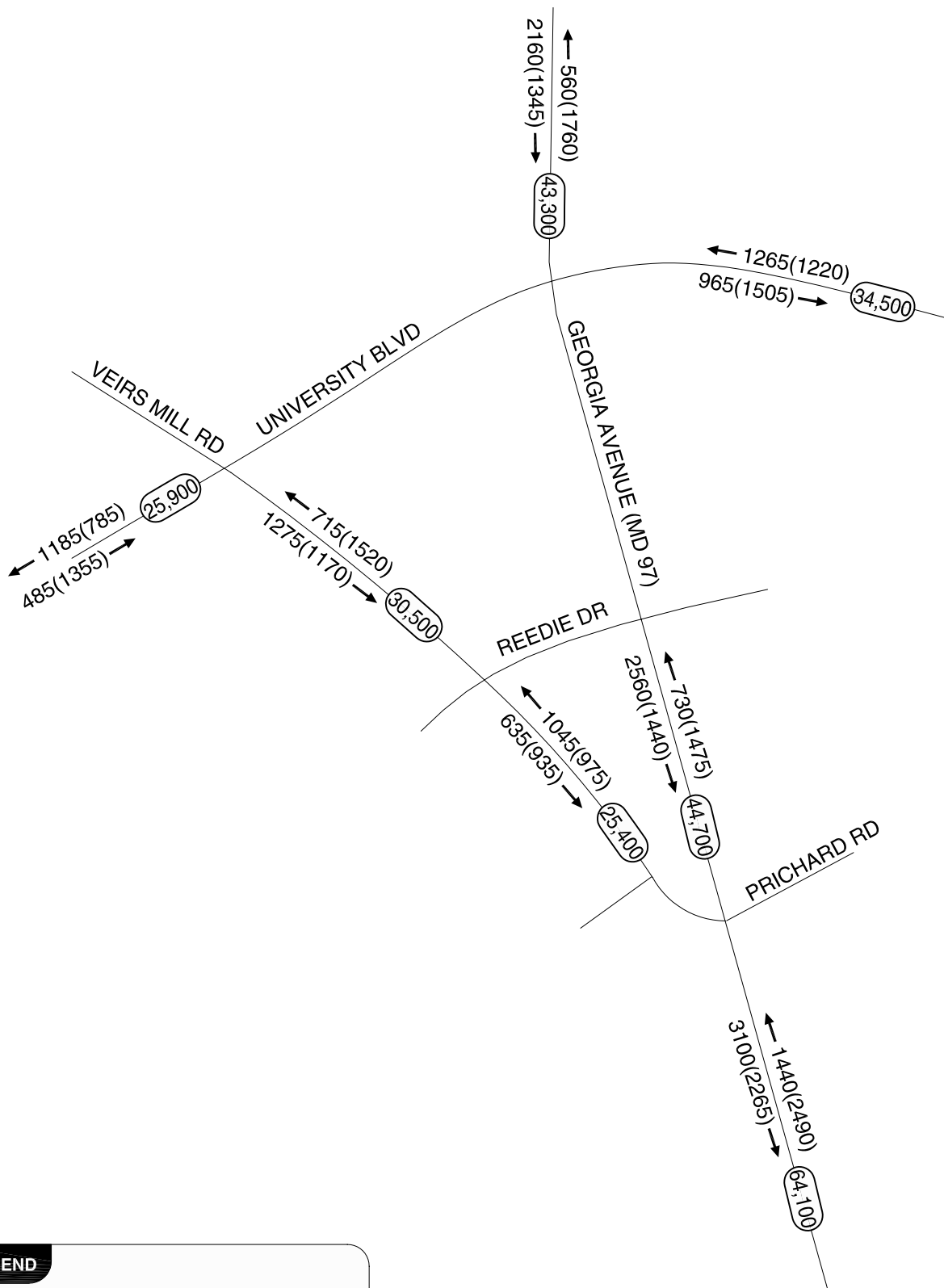
The updated and balanced turning movement volumes are shown in Figure 3 for the weekday a.m. and p.m. peak hours along with intersection levels of service. The findings from the level-of-service analysis are discussed in the *Traffic Operations Analysis Results* section of this report. *Appendix B includes all raw traffic data.*

¹ Includes Westfield Shoppingtown Expansion traffic along with Westfield's planned geometric improvements.



**EXISTING LANE CONFIGURATIONS AND TRAFFIC CONTROL DEVICES
WHEATON, MARYLAND**

FIGURE
1

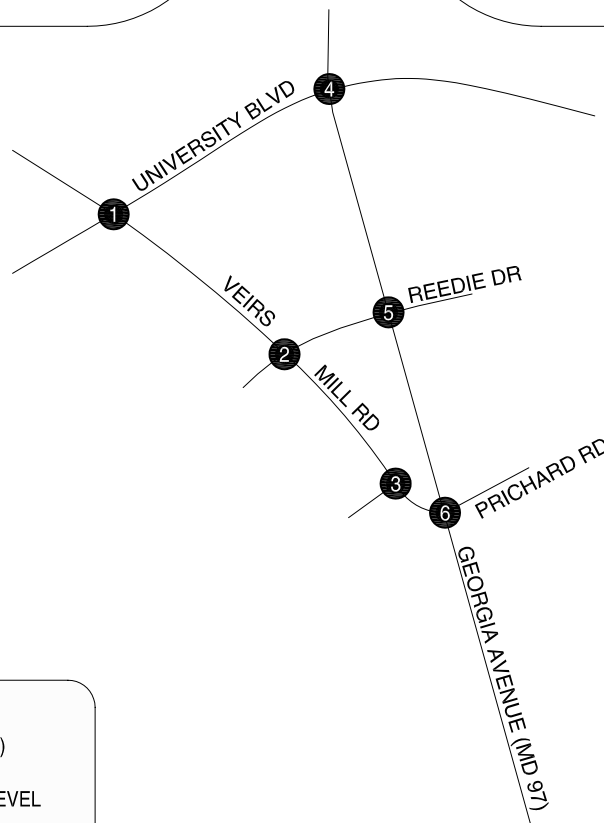
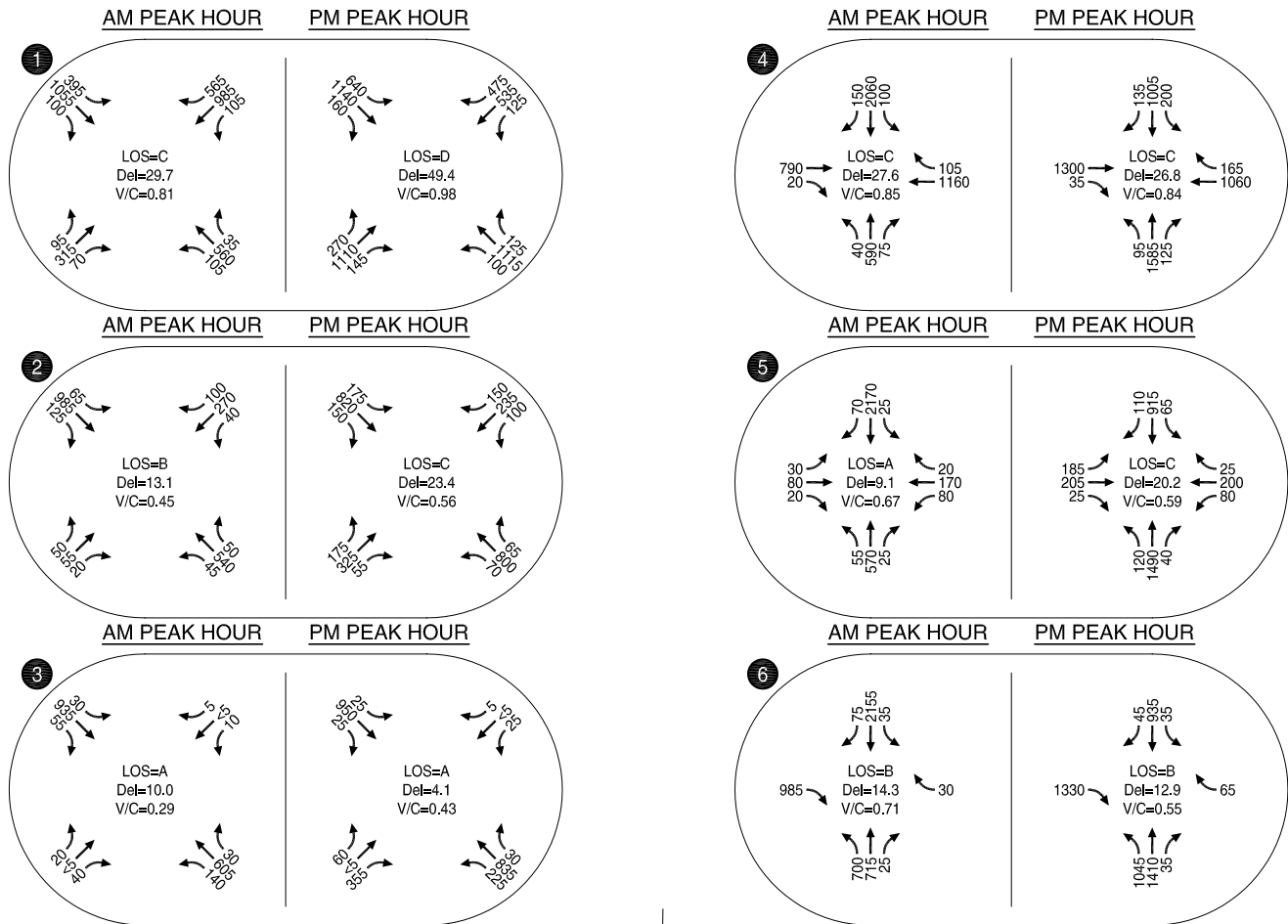


LEGEND

- ## - AM VOLUME
- (##) - PM VOLUME
- ##,### - COMBINED DAILY VOLUME

**SUMMARY OF RECENT SHA TUBE COUNTS
WHEATON, MARYLAND**

FIGURE
2



(NO SCALE)

LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = INTERSECTION LEVEL OF SERVICE
 (SIGNALIZED)/CRITICAL MOVEMENT LEVEL
 OF SERVICE (UNSIGNALIZED)
 Del = INTERSECTION AVERAGE CONTROL DELAY
 (SIGNALIZED)/CRITICAL MOVEMENT CONTROL
 DELAY (UNSIGNALIZED)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

**EXISTING TRAFFIC CONDITIONS
 WEEKDAY AM & PM PEAK HOURS
 WHEATON, MARYLAND**

FIGURE

3

2005 Build Traffic Conditions

The Westfield Shoppingtown in Wheaton is currently in the middle of a two-phase expansion of their existing facilities. Phase One is complete and includes the addition of a Giant Foods Supermarket and new in-line commercial retail uses along University Boulevard. Phase Two consists of the renovation and expansion of their existing facilities to include a Macy's department store and new stores and restaurants. Phase Two is scheduled for completion in Spring 2005. As part of the expansion, Westfield was required by the Maryland-National Capital Park and Planning Commission to complete off-site transportation improvements to University Boulevard and Georgia Avenue to mitigate automobile and pedestrian impacts. These improvements are identified in correspondences between the Montgomery County Department of Park and Planning, Maryland-National Capital Parking and Planning Commission, and the Department of Permitting Services. *Appendix A includes copies of the correspondence.*

As part of their Phase One expansion, Westfield moved the traffic signal from the Midvale Road/University Boulevard intersection to the Valley View Drive/University Boulevard intersection. The Valley View Drive/University Boulevard intersection serves as the primary entrance to the Giant Foods Supermarket.

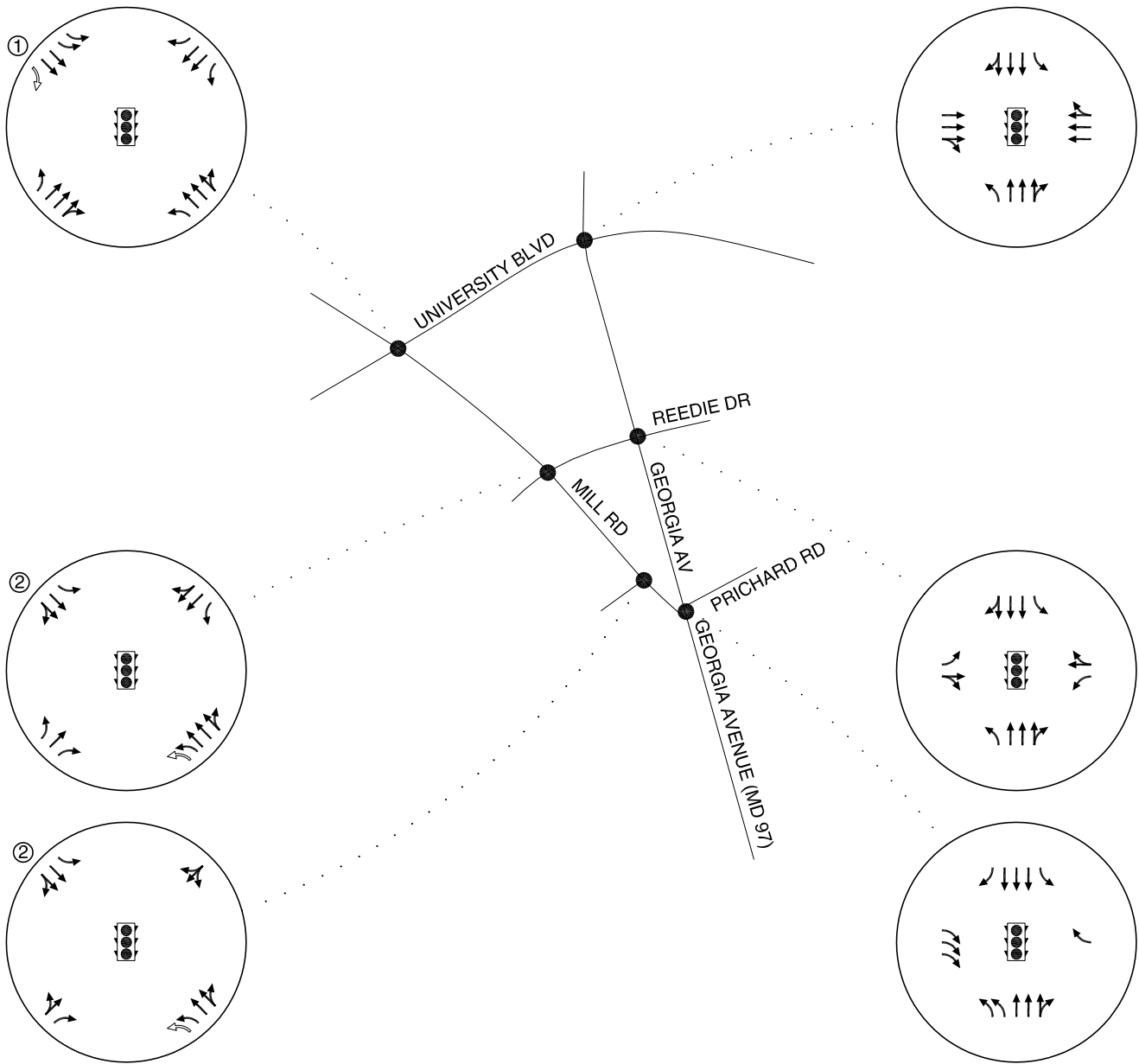
Westfield is planning to construct improvements along Veirs Mill Road as part of their Phase Two expansion. These improvements do not affect the curb-to-curb width on Veirs Mill Road with the exception of the segment on Veirs Mill Road in the southbound direction between the South Access and Georgia Avenue.

The following intersection improvements are planned:

- **Georgia Avenue/Veirs Mill Road** – Extend the storage length for northbound left-turning vehicles.
- **South Access/Veirs Mill Road** - Construct a second left-turn lane from Veirs Mill Road into the Westfield Shoppingtown. Reduce the number of northbound through lanes from three to two.
- **North Access-Reedie Drive/Veirs Mill Road** – Construct a second left-turn lane from Veirs Mill Road into the Westfield Shoppingtown. Reduce the number of southbound through lanes on Veirs Mill Road from three to two.
- **University Boulevard/Veirs Mill Road** – Reduce the number of southbound through lanes on Veirs Mill Road through the intersection from three to two. Convert the existing outside through lane on southbound Veirs Mill Road to a right-turn only except for buses. Buses would be allowed as through movements from the right-turn lane.

Figure 4 illustrates the lane configurations and traffic control devices.

Year 2005 traffic volumes were developed by adding site-generated traffic from the Westfield Shoppingtown expansion to the existing traffic volumes. The Westfield Shoppingtown expansion traffic volumes were obtained from the *Traffic Impact Analysis for Wheaton Plaza Expansion, Volume 1* (Traffic Group, November 17, 1998). Figure 5 shows the 2005 Build traffic conditions at the study intersections for both the weekday a.m. and p.m. peak hours.

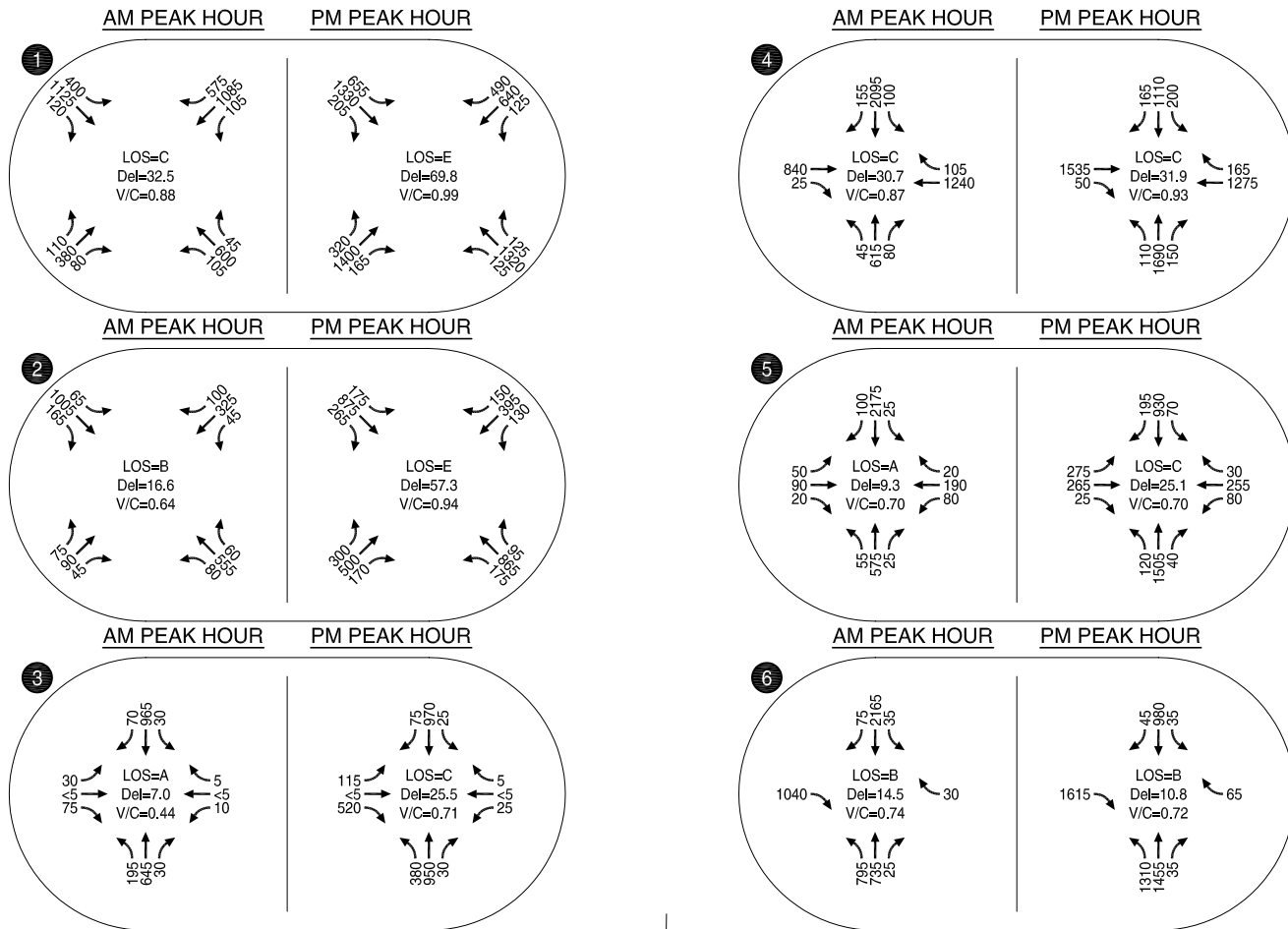


LEGEND

↑ - WESTFIELD IMPROVEMENT

- ① Convert shared through/right lane to right-turn only lane (except for buses).
- ② Reduce southbound through lanes on Veirs Mill Road from three to two lanes.

**WESTFIELD PLANNED IMPROVEMENTS
WHEATON, MARYLAND**



(NO SCALE)

LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = INTERSECTION LEVEL OF SERVICE
 (SIGNALIZED)/CRITICAL MOVEMENT LEVEL
 OF SERVICE (UNSIGNALIZED)
 Del = INTERSECTION AVERAGE CONTROL DELAY
 (SIGNALIZED)/CRITICAL MOVEMENT CONTROL
 DELAY (UNSIGNALIZED)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

**YEAR 2005 BUILD TRAFFIC CONDITIONS
 WEEKDAY AM & PM PEAK HOURS
 WHEATON, MARYLAND**

FIGURE

5

2005 Build Traffic Conditions with KAI Recommended Improvements

KAI developed recommendations for roadway improvements that address pedestrian safety and accessibility deficiencies in the Wheaton Metro area. These improvements were developed based on information gathered during a community field walk, public involvement meetings, and an analysis of traffic and pedestrian conditions. The *2005 Build Traffic Conditions with KAI Recommended Improvements* section summarizes the traffic operational impacts of the pedestrian improvements. It is assumed that the Pedestrian Safety Study improvements would be implemented in addition to the Westfield Shoppingtown Expansion geometric improvements.

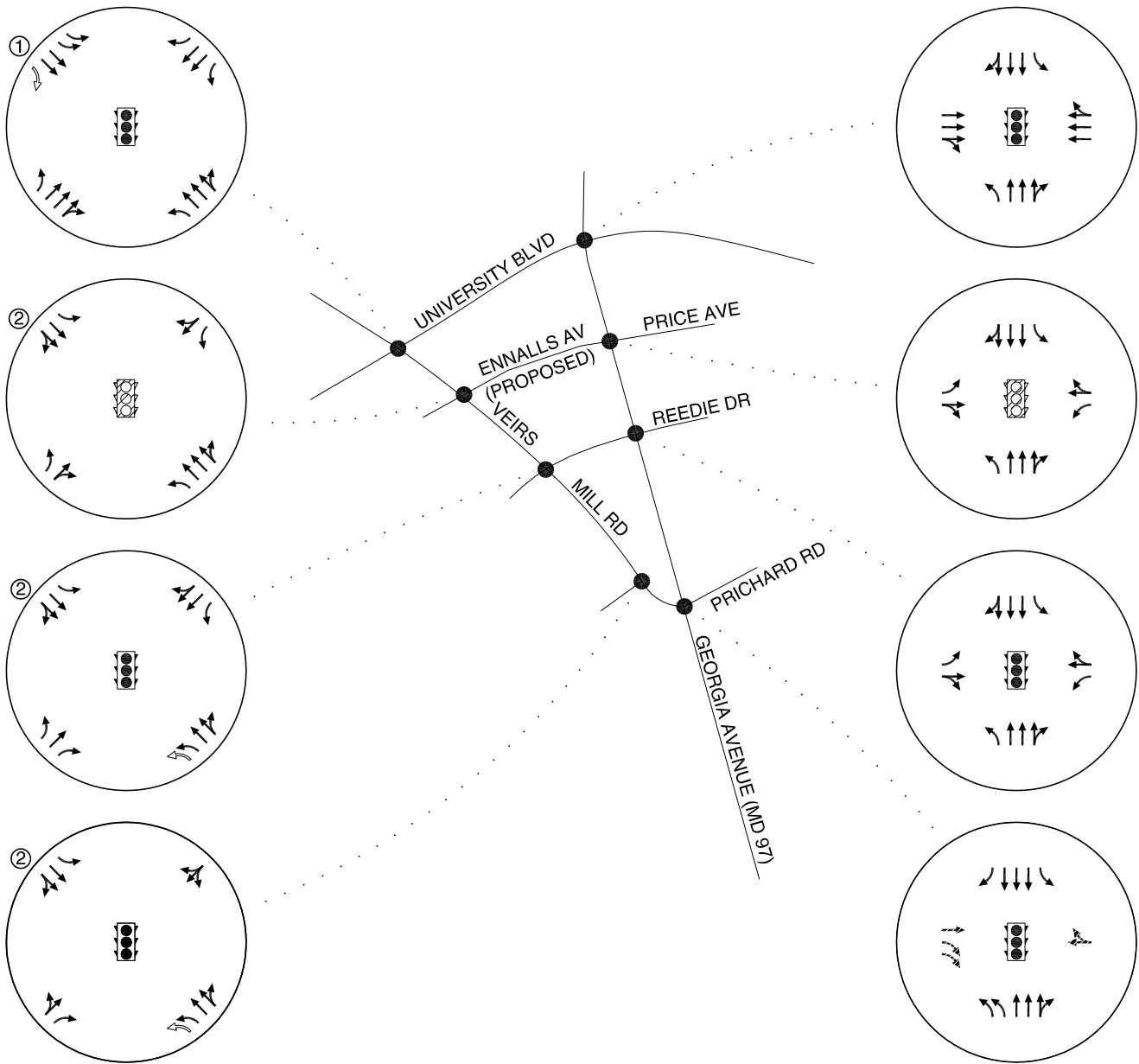
The following bullet items describe the transportation improvements proposed as part of the Wheaton Metro Area Pedestrian Safety Study:

- Realign Veirs Mill Road approach to Georgia Avenue to create a conventional four-legged intersection with pedestrian crossings
- Lift the parking restriction on Veirs Mill Road in the northbound direction to allow on-street parking between the Metro Access and Ennalls Avenue
- Extend Ennalls Avenue to the east to intersect Georgia Avenue directly opposite Price Avenue
- Provide a direct connection from Ennalls Avenue to the Westfield Shoppingtown
- Install a traffic signal at the Ennalls Avenue/Veirs Mill Road intersection
- Install a traffic signal at the newly-created Ennalls Avenue-Price Avenue/Georgia Avenue intersection

Figure 6 illustrates the KAI recommended lane configurations and traffic control devices.

Under this scenario, traffic volumes were redistributed across the study intersections to account for the Ennalls Avenue Extension. The Ennalls Avenue Extension is expected to attract a portion of drivers that travel to the Westfield Shoppingtown from the east and currently use University Boulevard and Reddie Drive. In addition, a portion of drivers that currently use the Reddie Drive entrance on Veirs Mill Road and the East Avenue and Midvale Road entrances on University Boulevard to access uses on the north and west portions of the Westfield Shoppingtown site (such as Giant Foods) are expected to use the new Ennalls Avenue entrance.

Traffic volumes were redistributed to account for the Ennalls Avenue Extension. The redistribution was based on an assessment of travel routes motorists are most likely to take in order to minimize their delay and travel time. Drivers are more likely to seek alternative travel routes in cases where congestion occurs, which is frequent during peak periods in the Wheaton Metro area.



LEGEND

- WESTFIELD IMPROVEMENT
- KAI RECOMMENDED IMPROVEMENT

- ① Convert shared through/right lane to right-turn only lane (except for buses).
- ② Reduce southbound through lanes on Veirs Mill Road from three to two lanes.

**KAI RECOMMENDED IMPROVEMENTS
WHEATON, MARYLAND**

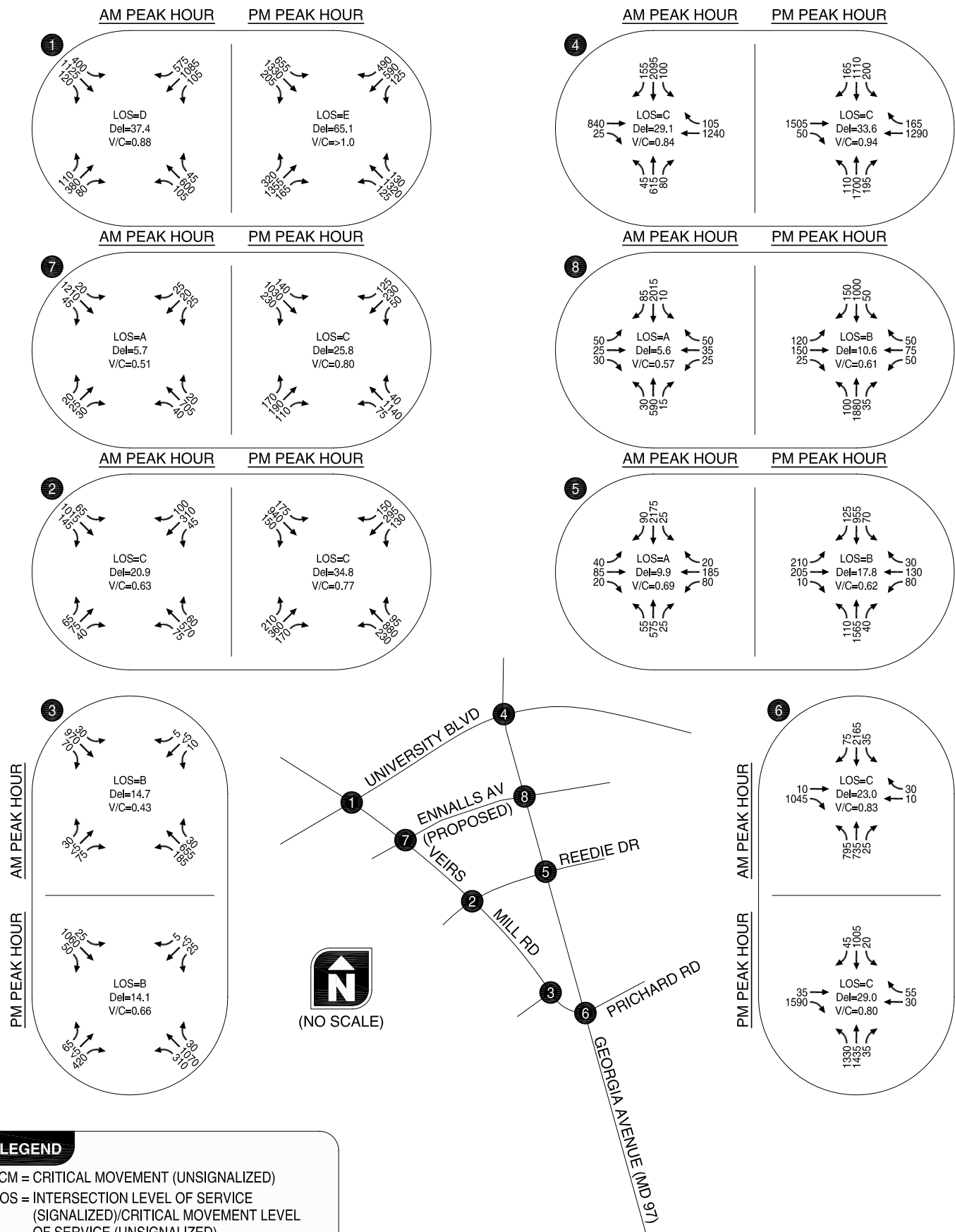
The Westfield Shoppingtown site traffic is expected to redistribute among all three site-accesses on Veirs Mill Road in proportion to the capacity available at each intersection. Northbound left-turning volumes were reduced by 70 vehicles during the p.m. peak hour at the Metro Access/Veirs Mill Road intersection and reassigned to the Reddie Drive access and the proposed Ennalls Avenue access. Left-turning traffic volumes exiting the Westfield site were reduced by 90 vehicles at the Reddie Drive/Veirs Mill Road intersection and by 50 vehicles at the Metro Access/Veirs Mill Road intersections in order to utilize available capacity at the Ennalls Avenue access. In total, approximately 300 vehicles during the weekday p.m. peak hour are expected to divert from Reddie Drive to the Ennalls Avenue extension.

Figure 7 displays the 2005 traffic volumes with the Ennalls Avenue extension for both the weekday a.m. and p.m. peak hour time periods.

Traffic Operations Analysis Results

This section summarizes the results of the operations analysis conducted for all study intersections. All intersections were analyzed using both the Critical Lane Volume procedure and the Highway Capacity Manual procedure embedded in the Synchro traffic analysis software. The Critical Lane Volume procedure was performed to determine if the intersections meet Montgomery County intersection capacity standards. The Synchro analysis was performed to identify more detailed aspects of intersection operations such as lane group capacity, average vehicle delay, and 95th percentile vehicle queues.

The Montgomery County *Local Area Transportation Review Guidelines* identify an intersection Critical Lane Volume standard of 1,800 vehicles or less during peak hour conditions. Table 1 shows the results of the Critical Lane Volume analysis. *Appendix C includes Critical Lane Volume Analysis worksheets.*



**TOTAL TRAFFIC CONDITIONS WITH KAI IMPROVEMENTS
WEEKDAY AM & PM PEAK HOURS
WHEATON, MARYLAND**

FIGURE

7

Table 1
Critical Lane Volume Summary

Intersection	Existing Conditions	2005 Build Conditions	2005 Build Conditions with KAI Improvements
Weekday AM Peak Hour			
Veirs Mill Road/University Blvd.	1201	1590	1590
Veirs Mill Road/Ennalls Avenue			785
Veirs Mill Road/Reedie Drive	529	963	937
Veirs Mill Road/Metro Access	517	687	679
Veirs Mill Road/Georgia Avenue	1274	1315	1355
Georgia Avenue/University Blvd.	1326	1375	1375
Georgia Avenue/Ennalls Avenue			942
Georgia Avenue/Reedie Drive	1104	1157	1138
Weekday PM Peak Hour			
Veirs Mill Road/University Blvd.	1442	1602	1604
Veirs Mill Road/Ennalls Avenue			1290
Veirs Mill Road/Reedie Drive	874	1327	1190
Veirs Mill Road/Metro Access	741	1110	1043
Veirs Mill Road/Georgia Avenue	1005	1170	1215
Georgia Avenue/University Blvd.	1327	1467	1477
Georgia Avenue/Ennalls Avenue			1004
Georgia Avenue/Reedie Drive	1041	1202	1034

As shown in Table 1, all intersections meet the critical lane volume standard under all scenarios. The intersections with the highest critical lane volumes under existing conditions are Georgia Avenue/University Boulevard and Veirs Mill Road/University Boulevard. Although the critical volumes increase with the growth in future traffic volumes, the intersections remain below the Montgomery County threshold of 1,800 vehicles during the peak hour.

The critical lane volumes at the two existing Shoppingtown access points along Veirs Mill Road (Reedie Drive and Metro Access) are reduced under the KAI Improvement scenario. This is due to the redistribution of traffic to the Ennalls Avenue Extension and is primarily associated with traffic traveling to/from the Westfield Shoppingtown.

Table 2 summarizes the results of the detailed traffic operations analysis. This analysis was performed using Synchro and the results were obtained from the Highway Capacity Manual (HCM) output report produced by Synchro. In general, level-of-service "D" or better and a volume-to-capacity (V/C) ratio less than 1.0 are desired for peak hour operations. *A description of level of service and the criteria by which they are determined is provided in Appendix D. HCM analysis worksheets are included in Appendix E.*

Signal timing data for the existing conditions analysis was obtained from signal timing sheets provided by Montgomery County. Based on a review of these timing sheets, all signalized intersections were analyzed assuming a 120-second cycle length. The intersection phase splits and network offsets were optimized in Synchro for all scenarios.

Table 2
Traffic Operations Summary

Intersections	Existing Conditions			2005 Build Conditions			2005 Build Conditions with KAI Improvements		
	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Weekday AM Peak Hour									
Veirs Mill Road/ University Blvd.	0.81	29.7	C	0.88	32.5	D	0.88	38.0	D
Veirs Mill Road/ Ennalls Avenue							0.51	5.7	A
Veirs Mill Road/ Reedie Drive	0.45	13.1	B	0.64	16.7	B	0.63	21.4	C
Veirs Mill Road/ Metro Access	0.29	10.0	A	0.44	6.8	A	0.43	14.5	B
Veirs Mill Road/ Georgia Avenue	0.71	14.3	B	0.74	14.3	B	0.83	22.9	C
Georgia Avenue/ University Blvd.	0.85	27.7	C	0.87	30.7	C	0.84	29.1	C
Georgia Avenue/ Ennalls Avenue							0.57	5.6	A
Georgia Avenue/ Reedie Drive	0.67	9.1	A	0.70	9.4	A	0.69	9.6	A
Weekday PM Peak Hour									
Veirs Mill Road/ University Blvd.	0.98	49.2	D	0.99	69.9	E	>1.0	65.0	E
Veirs Mill Road/ Ennalls Avenue							0.80	25.4	C
Veirs Mill Road/ Reedie Drive	0.56	23.4	C	0.94	57.1	E	0.77	34.8	C
Veirs Mill Road/ Metro Access	0.43	3.9	A	0.71	25.5	C	0.66	14.1	B
Veirs Mill Road/ Georgia Avenue	0.55	12.8	B	0.72	10.4	B	0.80	28.9	C
Georgia Avenue/ University Blvd.	0.84	26.5	C	0.93	32.0	C	0.94	33.6	C
Georgia Avenue/ Ennalls Avenue							0.61	10.6	B
Georgia Avenue/ Reedie Drive	0.60	20.7	C	0.70	24.9	C	0.60	17.6	B

A discussion of the traffic operational results for each intersection is provided in the following sections.

Veirs Mill Road/University Boulevard

The Veirs Mill Road/University Boulevard intersection currently operates near capacity under existing p.m. peak hour conditions. The intersection is expected to operate at or just over capacity with the additional traffic forecasted under the future traffic conditions scenario.

Field observations confirm that eastbound left-turning motorists experience excessive delays during peak conditions. Insufficient green time is available for these vehicles to clear the intersection during peak cycles. Given the high demand on the remaining approaches, there is no available green time that can be redistributed to this movement.

Both Build scenarios recommend reconfiguring the outside through lane on the southbound Veirs Mill approach to a bus-only lane. Thus, Veirs Mill Road would carry two through lanes through the University Boulevard intersection and match the planned cross-section on Veirs Mill Road south of University Boulevard. Field observations show that the outside through lane is underutilized, in part due to the high volume of bus traffic associated with the bus stop south of Ennalls Avenue.

The planned and KAI improvements include reconfiguring the westbound shared through/right-turn lane to a right-turn only lane given that the right-turn movement is the dominant movement on this approach during the weekday p.m. peak hour. Reconfiguring the outside through lane will improve operations for westbound right-turning vehicles and will have minimal impacts to westbound through traffic.

Veirs Mill Road/Ennalls Avenue

Northbound vehicle queues from the University Boulevard intersection currently spillback across Ennalls Avenue. These queues block pedestrian movements and vehicles attempting to turn to/from Ennalls Avenue and the driveway that serves the parking lot to the west. A traffic signal is recommended at this location to assign right-of-way to all vehicular movements and pedestrians. The intersection is forecast to meet eight-hour, four-hour, and one-hour signal warrants with a connection in place to the Westfield Shoppingtown. With a traffic signal in place, this intersection is expected to operate at LOS "C" during the p.m. peak hour assuming isolated conditions. Without a signal in place, the side-street movements would operate over capacity and at LOS "F". *Signal warrant analysis worksheets are included in Appendix F.*

Given its close proximity to University Boulevard, through-vehicle queues on the northbound approach to the Veirs Mill Road/University Boulevard intersection are expected to continue to spill back to the signalized Ennalls Avenue intersection during congested periods. Results from the Synchro traffic operations analysis show that the 95th percentile vehicle queue for the northbound movement is 500 feet, whereas only approximately 325 feet is available. It is expected that this queue will block the signalized Ennalls Avenue intersection during 10-20 percent of the p.m. peak hour. Queues are not expected to spill back to Ennalls Avenue during remaining periods of the day.

In the opposite direction, southbound Veirs Mill traffic may block traffic at University Boulevard during up to five-percent of the p.m. peak hour as queues may extend from the signalized Veirs Mill Road/Ennalls Avenue intersection.

The 95th percentile queues for the back-to-back left-turn movements on Veirs Mill Road between University Boulevard and Ennalls Avenue are expected to overlap during the weekday p.m. peak hour. One approach to mitigating this condition is to restrict southbound left-turn movements from Veirs Mill Road onto Ennalls Avenue during peak periods.

On-street parking should be restricted on northbound Veirs Mill Road within 250 feet of the Ennalls Avenue intersection to allow for a third northbound through lane during peak periods.

Signal timing plans should be coordinated between the two intersections to minimize vehicle queue spillback. In addition, 'Do Not Block Intersection' signs should be placed on Veirs Mill Road and enforced.

The benefits associated with improved accessibility for pedestrians, designation of a pedestrian crossing location, increased mobility for turning vehicles, and increased redevelopment potential along Ennalls Avenue are believed to outweigh the negative impacts of queue spillback and increased delay to through vehicles on Veirs Mill Road during peak periods.

Veirs Mill Road/Reedie Drive

This intersection currently operates at level-of-service "D" and a volume-to-capacity (V/C) ratio of 0.55 during the critical weekday p.m. peak hour. With the addition of traffic from the Westfield Shoppingtown expansion and construction of the planned improvements, the intersection is forecast to operate with a volume-to-capacity ratio of 0.94 and at level of service "E".

The redistribution of Westfield Shoppingtown traffic associated with the Ennalls Avenue Extension is expected to improve operations at the Veirs Mill Road/Reedie Drive intersection to a volume-to-capacity ratio of 0.77 and Level of Service "C." This is primarily due to a reduction in southbound right-turning vehicles and a reduction in outbound traffic from Westfield Shoppingtown.

In summary, the addition of the Ennalls Avenue Extension is expected to improve traffic operations at the Veirs Mill Road/Reedie Drive intersection due to the provision of an alternative travel route.

Veirs Mill Road/Metro Access

The Veirs Mill Road/University Boulevard intersection is currently operating below capacity during existing a.m. and p.m. peak hour conditions. The intersection is expected to continue to operate below capacity with the additional traffic forecasted under the future traffic scenarios. Both future scenarios assume the northbound approach will accommodate dual left-turn lanes and two through lanes. This intersection configuration maintains two-lanes southbound on Veirs Mill Road between University Boulevard and Georgia Avenue.

Veirs Mill Road/Georgia Avenue/Prichard Road

The Veirs Mill Road/Georgia Avenue/Prichard Road intersection currently operates well below capacity under existing a.m. and p.m. peak hour conditions. The weekday a.m. peak hour is the critical time period for this intersection due to the heavy volumes on Georgia Avenue and Veirs Mill Road that are destined towards Washington D.C.

Under the current phasing, the northbound through movement operates continuously without positive control that stops this movement. The southbound left-turn movement yields to northbound through vehicles and is not controlled by the traffic signal. The remaining movements operate with two phases: the northbound left-turn and southbound right-turn movements in one phase, and the southbound through movement in the other phase. The

intersection is expected to continue to operate below capacity under the *Future Volumes with Planned Improvements* scenario.

To improve pedestrian conditions, KAI recommends realigning the southbound Veirs Mill Road approach opposite Prichard Road to intersect Georgia Avenue at an angle as close to 90-degrees as possible. Through movements would be allowed between Veirs Mill Road and Pritchard Road, and the number of right-turn lanes on Veirs Mill Road would be reduced from three to two. As part of the realignment, crosswalks would be provided on the north, south, and east legs of the intersection. A crosswalk on the west leg is not recommended given that it does not serve a logical destination from the southwest corner of the intersection and it would require an extraordinary amount of green time to cross, in the absence of a two-stage pedestrian crossing. The heavy southbound right-turn movement would continue to “overlap” with the northbound left-turn movement.

Results from the capacity analysis show that the reconfigured intersection would operate with a V/C ratio of 0.83 and at level-of-service “C” during the weekday a.m. peak hour and with a V/C of 0.80 and at level-of-service “C” during the weekday p.m. peak hour. The reconfigured intersection meets SHA and County operating standards under the forecast traffic conditions. Adequate green time is available to provide pedestrian crossings on the north, south, and east legs of the intersection.

Georgia Avenue/University Boulevard

The Georgia Avenue/University Boulevard intersection operates at level-of-service “C” during the weekday a.m. and p.m. peak hours. Traffic volumes at this intersection fluctuate a significant amount based on a review of historical traffic volumes. Thus, traffic operations during certain days of the week are likely worse than is reported in Table 2. The increase in traffic volumes is likely associated with incidents or construction on alternative routes.

The intersection is expected to operate acceptably under future year traffic conditions. The KAI alternative shows slightly different results from the *Planned* scenario given to the reassignment of traffic volumes associated with the Ennalls Avenue extension. No improvements to this intersection are planned or recommended by KAI as part of the Wheaton Metro Area Pedestrian Safety Study.

Georgia Avenue/Ennalls Avenue

This intersection currently operates as an unsignalized “T” intersection less than 200 feet south of University Boulevard. Ennalls Avenue would be realigned to intersect Georgia Avenue directly opposite Price Avenue approximately 450 feet south of University Boulevard.

With the Ennalls Avenue Extension in place, the Georgia Avenue/Ennalls Avenue intersection is forecasted to operate with a V/C ratio of 0.61 and at level-of-service “B” during the critical weekday p.m. peak hour. The intersection is forecast to meet signal warrants. Appendix F includes signal warrant analysis worksheets.

Georgia Avenue/Reedie Drive

The Georgia Avenue/Reedie Drive intersection currently operates at level-of-service “C” during the weekday p.m. peak hour. The volume-to-capacity ratio is forecast to increase by 0.10 due to the addition of Westfield Shoppingtown traffic, however the intersection is still expected to maintain level-of-service “C” operations.

The redistribution of Westfield Shoppingtown traffic from the Reedie Drive access to the Ennalls Avenue access is shown to improve the Georgia Avenue/Reedie Drive intersection operations. With the Ennalls Extension in place, the intersection is forecast to operate similar under future conditions as under existing conditions.

No improvements are proposed to this intersection as part of the *Planned Improvements* or the recommended KAI improvements.

Conclusions and Recommendations

Based on the results of our operational analysis, the following conclusions and recommendations can be made:

Conclusions

- The University Boulevard/Veirs Mill Road intersection currently operates near-capacity or at-capacity during the weekday p.m. peak hour. All other study intersections currently operate at level-of-service “C” or better.
- With the addition of traffic generated by the Westfield Shoppingtown expansion and with their proposed improvements in place on Veirs Mill Road, all signalized intersections in the Wheaton triangle are forecast to operate at level-of-service “C” or better with the exception of the University Boulevard/Veirs Mill Road and Reddie Drive/Veirs Mill Road intersections. These intersections are forecast to operate at level-of-service “E” during the weekday p.m. peak hour.
- The Ennalls Avenue Extension would provide a second access point for Westfield Shoppingtown traffic entering and exiting the site along Veirs Mill Road. This is expected to relieve through traffic volumes on Reddie Drive and reduce turning movements at the Reddie Drive/Veirs Mill Road intersection. The Ennalls Avenue Extension improves pedestrian access by providing an additional signalized crossing location and reducing the block length on Veirs Mill Road.
- Traffic signal warrants are met at the Ennalls Avenue/Veirs Mill Road and Ennalls Avenue-Price Avenue/Georgia Avenue intersections with the Ennalls Avenue Extension in place. The analysis assumes that a direct connection will be provided from Ennalls Avenue to the Westfield Shoppingtown.
- The Georgia Avenue/Veirs Mill Road intersection is forecast to operate acceptably with the proposed reconfiguration of the Veirs Mill Road approach to form a four-legged intersection.

Recommendations

- SHA District 3 should plan for the reconfiguration of Veirs Mill Road at Georgia Avenue and consider introducing the project as a funding candidate for the Crash Prevention Program to make the greatest use of the planned Westfield improvements to the intersection. As part of the improvement, crosswalks should be provided on the north, south, and east approaches. Appropriate signing should be provided to notify to drivers that pedestrian crossings occur at the intersection.
- Montgomery County should identify opportunities to incorporate the Ennalls Avenue-to-Westfield Shoppingtown connection and install a traffic signal at the Ennalls Avenue/Veirs Mill Road intersection as part of future development activity at intersection.
- Montgomery County should identify opportunities to construct the Ennalls Avenue Relocation from Grandview Avenue to Georgia Avenue. The new roadway should intersect Georgia Avenue directly opposite Price Avenue and include a traffic signal.
- SHA District 3 should prepare a Memorandum of Agreement to send to Montgomery County to lift the parking restriction on northbound Veirs Mill Road between the Metro

access and 250-feet south of Ennalls Avenue. Curb bulbouts should be constructed at major intersections. On-street parking in this section should be provided full time.

In summary, the improvements identified as part of the Pedestrian Safety Study are expected to increase the number of pedestrian crossing locations, increase pedestrian comfort, calm traffic, and improve driver awareness of pedestrians. Additionally, the analysis shows that Montgomery County's operational standards will be met with the pedestrian safety improvements in place.



KITTELSON & ASSOCIATES, INC.
TRANSPORTATION PLANNING/TRAFFIC ENGINEERING

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TECHNICAL MEMORANDUM

Wheaton Metro Area Pedestrian Safety Study Parking Supply Analysis Summary

Date: July 1, 2004

Project #: 6112

To: Nat Bottigheimer, MDOT

From: Judith Gray & Yolanda Takesian

cc: Ed Strocko, MDOT
Rob Padgett, Cambridge Systematics

Introduction

Parking conditions impact many characteristics of the downtown environment, including economic viability, urban landscape, the pedestrian environment, and mode choice. This section describes the current parking conditions in the study area and identifies issues warranting further consideration to meet future needs. This assessment is based on parking inventory and utilization data provided by Montgomery County, review of a parking study conducted in 1996, and field observations during a weekday afternoon in December 2003.

Existing Parking System

Montgomery County Department of Public Works owns and manages approximately 1,350 parking spaces in the Wheaton Parking Lot District, including on-street spaces, surface lots, and one garage. Just over 60% of the spaces are designated for stays of eight hours or longer. These are primarily located in the garage. The remaining spaces are for durations of three hours or less. Several properties have accessory parking lots; no information was available regarding the private parking inventory. Table 1 summarizes the current public parking inventory.

Table 1 Existing Public Parking Inventory

Location	Short Term	Long Term	Total
On Street	286	36	322
Surface Lot	256	153	409
Garage	0	625	625

Total	542	814	1,356
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The on-street and portions of the off-street surface lots utilize parking meters. Permits are also available for all-day parking in some surface lots. Free all-day parking is provided in the garage as in incentive to employees so that short-term parking is preserved for customers and visitors.

Utilization

Utilization analysis describes the parking occupancy at a given time. A downtown area's parking system is usually considered to be at its effective capacity when the parking system is around 85% to 90% full. At this level of utilization, the parking system feels full, individuals have difficulty finding parking, and the area may lose some customers.

The county collects utilization data of its off-street facilities once each month. The counts are conducted on a typical weekday at around 2:00 p.m., which is often the peak period for downtown districts. This is consistent with the findings of a 1996 parking study by Desman Associates which was conducted for a portion of the study area. That study found that weekday parking utilization peaked at 1:00 and 2:00 p.m., with utilization levels of 74% and 73%, respectively. The county's utilization counts for June 2002 through July 2003 (FY '03) are depicted in Chart 1.

Chart 1. Monthly Public Parking utilization, July '02 through June '03

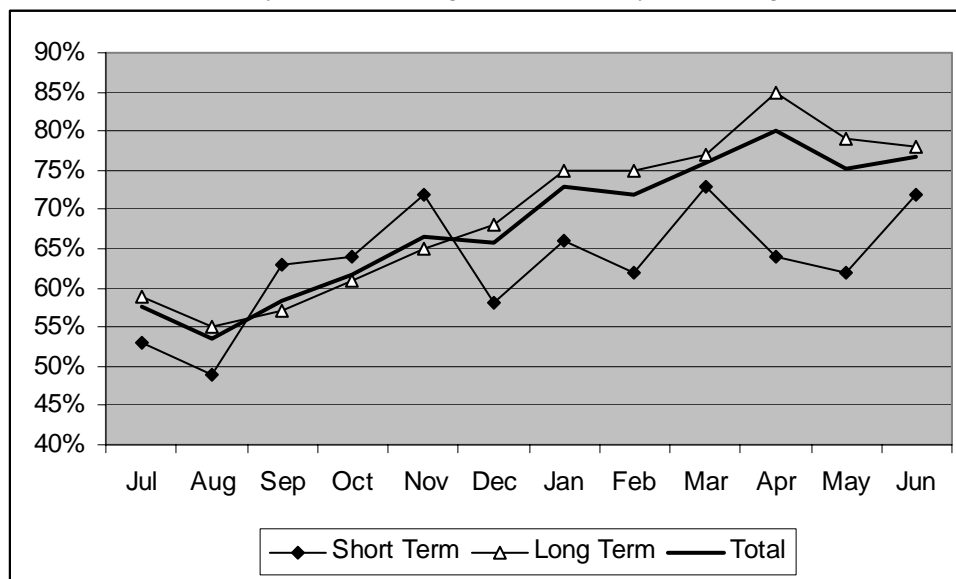


Chart 1 shows that peak parking utilization for FY '03 occurred in April for long-term parking and for the system overall. Short-term utilization peaked in November, with subsequent peaks in March and June. The chart also suggests a general upward trend in parking utilization. Chart 2 compares the total public parking utilization for three months in 2002 and 2003.

Chart 2. Comparative Parking Utilization, 2002 and 2003
Off-Street Public Parking

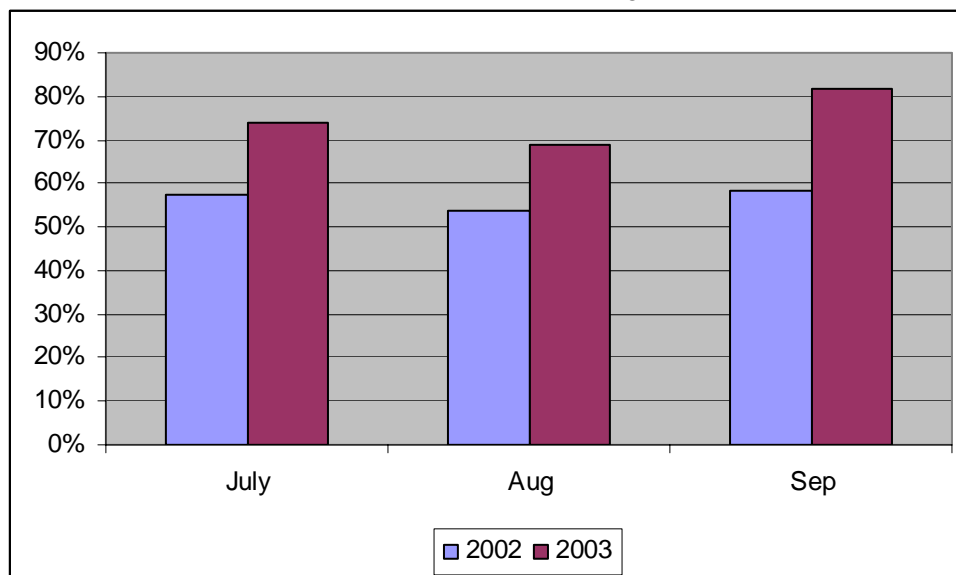


Chart 2 suggests a significant increase in parking utilization between 2002 and 2003. The primary reason for this is the redevelopment of former “Tuesday Morning” parking lot, which shifted existing demand onto public facilities. The increase in demand ranged from 28% to 40% for the time periods evaluated.

Although the data indicate considerable growth in peak parking, the peak utilization was 80% in April 2003, which is under the effective capacity. Parking utilization in the long-term spaces tends to be higher than short-term and was at 85% full in April. A higher utilization level is often tolerable for commuter parking, because commuters are usually more familiar with an area than customers and also tend to have regular parking locations. Therefore, the system does not show significant capacity constraints under current conditions.

Other Utilization Considerations

No data were provided for on-street parking utilization. Based on field observation, the utilization appears to be comparable to public surface parking at approximately 60% to 70% full.

Neither was utilization data available for private parking. Based on field observations, the private parking facilities are estimated to be approximately 50% to 60% full during a typical weekday afternoon. The 1996 parking study by Desmond Associates showed that weekday utilization was higher on private (76%) parking than public (62%) in April 1996 (for the MarketPlace subarea). It is unusual for private parking to have higher utilization than public parking. This condition in Wheaton probably reflects a preponderance of shared parking among retail strip tenants.

The Desmond study also showed higher utilization during Saturday than weekday. The private parking areas were at 88% utilization and public had considerable illegal parking, with vehicles outnumbering striped spaces at 104% utilization. Local staff indicate that weekday evening

parking is often higher than weekday daytime parking. This is because the area has a high proportion of restaurants and a relatively low amount of office development.

Turnover and Duration

Duration and turnover analysis is a useful way to gain an understanding of the types of parkers in the system and to evaluate enforcement. No data were available to analyze current conditions. The Desmond study cites a 1995 analysis that showed that 21% of vehicles on the weekend stayed beyond the time limit. On weekdays, the proportion of violators was 16%. Also staff indicate a barrier to pedestrian crossing Georgia Avenue, connecting Garage 45 with Wheaton Triangle. The result is employees meter feeding the short-term spaces in Lots 13 and 34.

Parking Recommendations

- Wheaton and the County should prepare a forecast of future parking needs to anticipate future parking costs likely to be incurred by the County.
- The development code should link tax or fee charges to parking demand for new developments.
- The development code should include support for shared parking facilities and other options for private developers.
- Travel mode split goals should be established to accommodate access to the district, particularly among employees. As employment in the district grows, emphasis should be on providing options for commuting, including transit, carpooling, and non-motorized modes as part of a local Transportation Demand Management Strategy.
- Locate structured parking within each of the quadrants formed by the major roadway network to reduce major highway crossings between parking and user destinations.

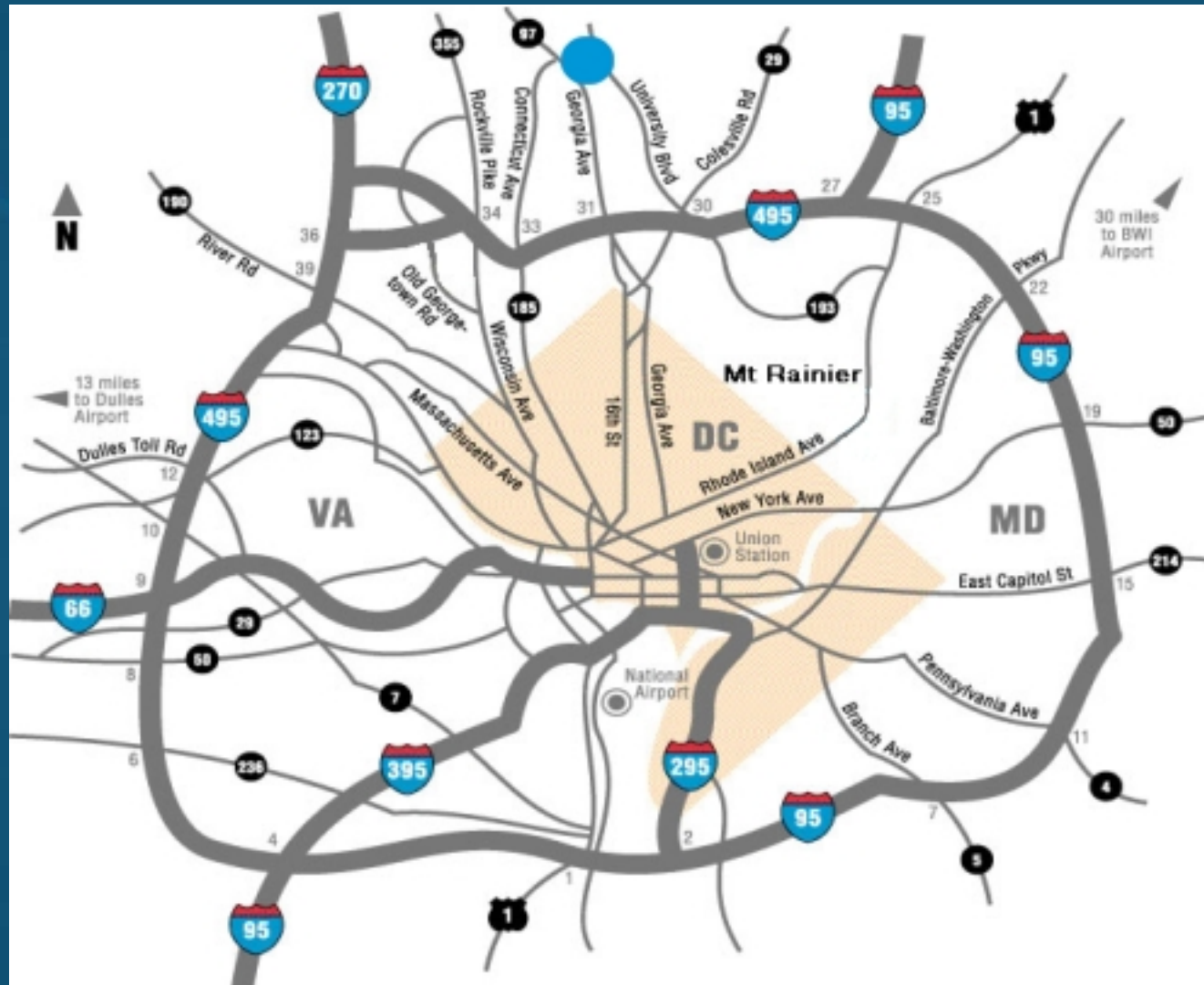
Pedestrian Safety in Transit Zones: Transforming the Suburban Commercial Strip

Wheaton Metro Station Area
Pedestrian Safety Evaluation Project



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Location & Context



Wheaton Metro Station Area

- “Access 2000”:
A sidewalk and
ADA inventory
- Note sidewalk
coverage, still
lots of crossing
mid-block



"Latino Deaths on the Corridor"

Questions and Answers With . . .

Casa de Maryland, an immigrant rights group, released a report last week calling attention to traffic deaths of pedestrians, most of them Latino, in the "international corridor"—a collection of largely immigrant communities centered on the intersection of University Boulevard and New Hampshire Avenue on the border of Prince George's and Montgomery counties. Casa officials also organized a news conference at which state and local leaders described plans for improving safety in the corridor. Gustavo Torres, the group's executive director, discussed the issue with staff writer Sarah C. Alvarado.

Q How would you describe the international corridor and its residents?

A This is our village. Our office is on University Boulevard, up the block from New Hampshire Avenue. The international corridor includes the intersecting neighborhoods of Langley Park, Takoma Park and Long Branch and represents the promise of a diverse Maryland. Seventy-two languages are spoken in our elementary schools. Traditional African foods and Indian arts are purchased in our corner stores. Salvadoran pupusas are sold in our streets. African Americans, whites and recent immigrants join together in building community. Despite working multiple jobs to support their families, people are active in their children's education and attend ESL [English as a second language] and citizenship classes.

What prompted Casa de Maryland to produce this report?

When Casa began looking at the numbers of Latino pedestrians killed here, we realized that we had a significant civil rights problem—a lack of public investment in communities whose residents are working class and people of color. In just 14 months, from February 2002 to April 2003, seven pedestrians—children, family wage earners, grandparents—were killed simply trying to cross the street. We heard from mothers and grandmothers permanently injured on their way to PTA meetings. We realized that this was a crisis and that we needed to focus policymakers on creating solutions.

Why is this area so dangerous?

Engineering. The international corridor was designed in the 1960s for cars. We live in a sea of concrete roads and parking lots. Despite all the environmental impediments to community life, our neighbors use public transportation, they walk to buy their groceries, and they engage in neighborhood-cleaning campaigns. We



GUSTAVO TORRES

are lucky that our neighbors insist on creating a community life despite the tremendous physical hurdles. But in order for them to do it safely, we must reshape our streets physically and make them safe. We don't want to eliminate commuters. We simply do not want cars to pose a danger to our children.

What have state and local authorities done, and what do they plan to do, to solve this problem?

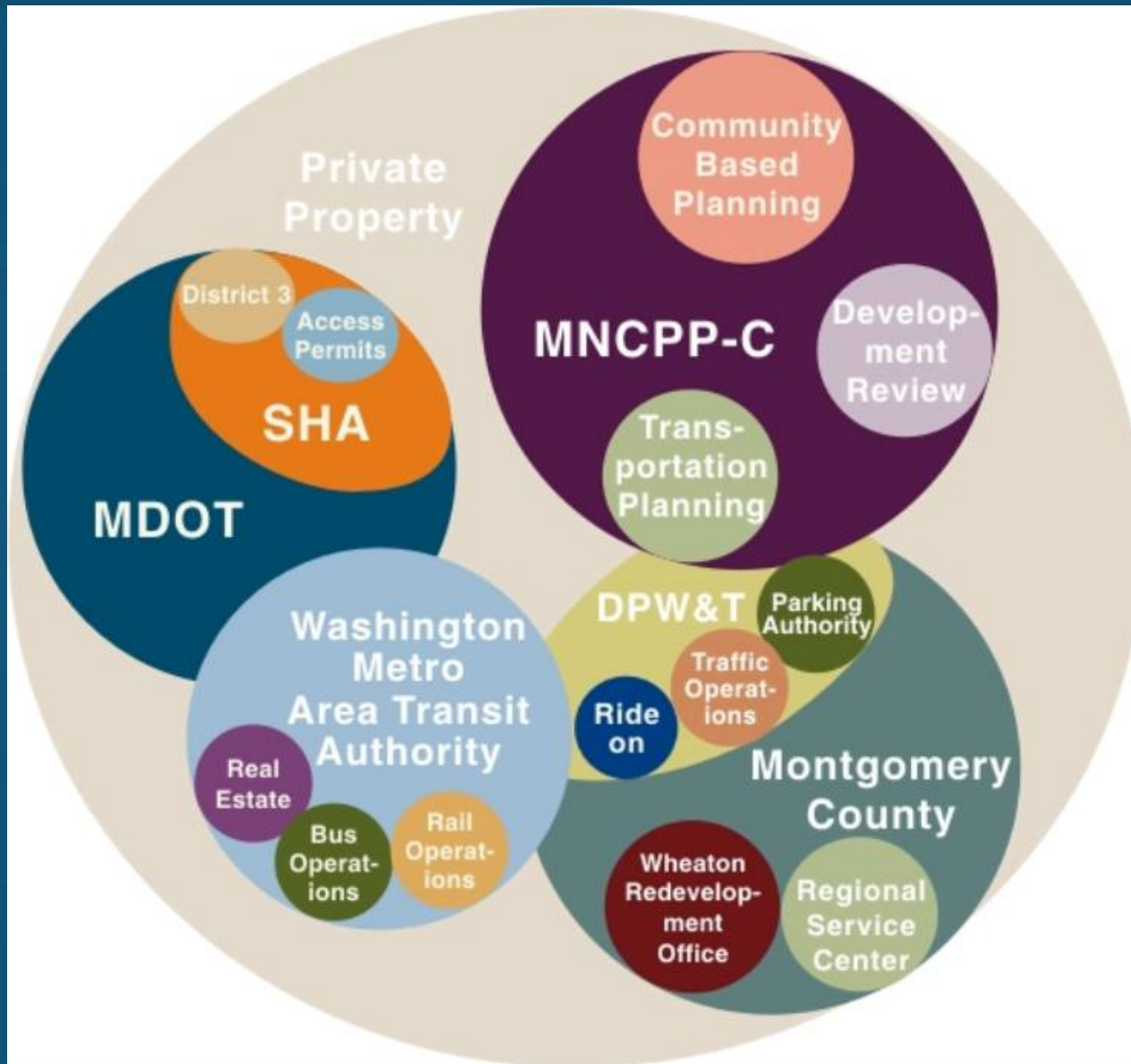
Montgomery and Prince George's counties have invested resources in bilingual campaigns to educate residents on road safety—a good first step. And the state committed to start-up spending of \$1 million to make very preliminary safety upgrades [to roads]. That's important because the major roads in the corridor are state roads, so the responsibility for them lies with the state. But everyone involved knows this is not enough.

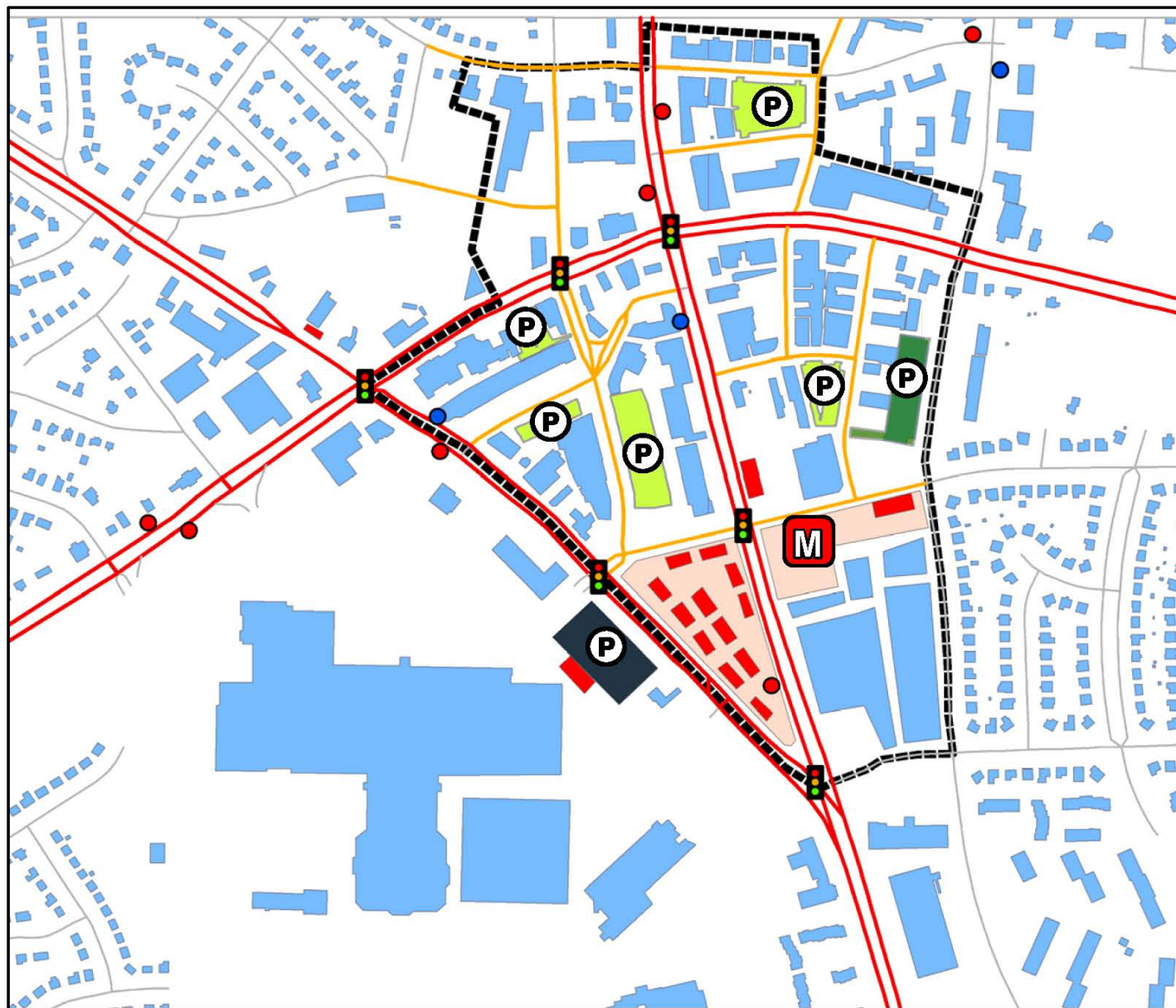
What more should be done?

Significant funds must be invested so that people stop dying. One study, completed by the Maryland State Highway Administration, recommended \$40 million worth of measures to reshape a significant portion of the international corridor. This included many steps that would increase pedestrian safety. Improved public transportation is also an essential ingredient to the solution. We must build Metro's Purple Line [from New Carrollton to Bethesda] to reduce the number of cars traveling through the corridor.






Agency Decision-Makers








Wheaton Area Pedestrian Study
Owners and Decision Makers



Legend

-  County Parking Authority
-  Montgomery County DPW&T
-  Central Business District Boundary



Roadway Network

-  County PDW & T
-  State Highway Admin.
-  Other Streets





Bus Stops

-  Bus Stop
-  Bus Stop with Bench

Bus Station Shelters

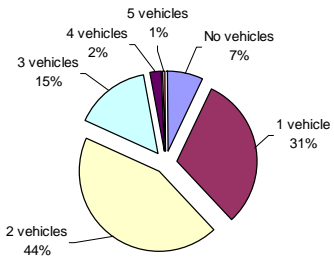
-  Shelter
-  Washington Area Metro Transit Authority

Parking

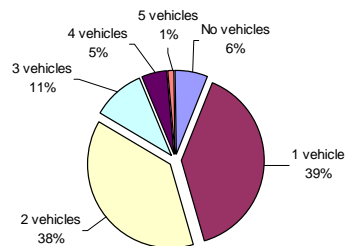
-  Surface Parking - County
-  Structured Parking - County
-  Structured Parking - WMATA
-  Buildings

Household Vehicle Availability by Census Tract

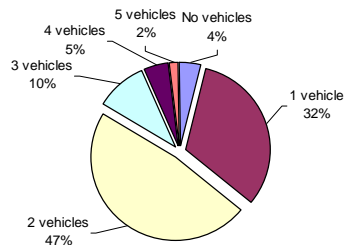
Census Tract 7037.02



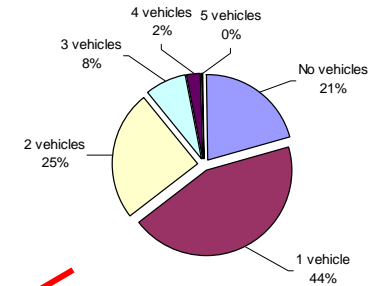
Census Tract 7036.01



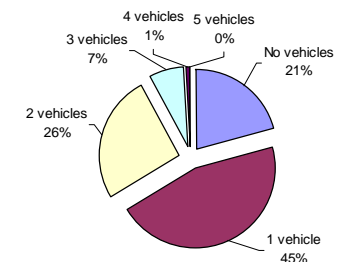
Census Tract 7036.02



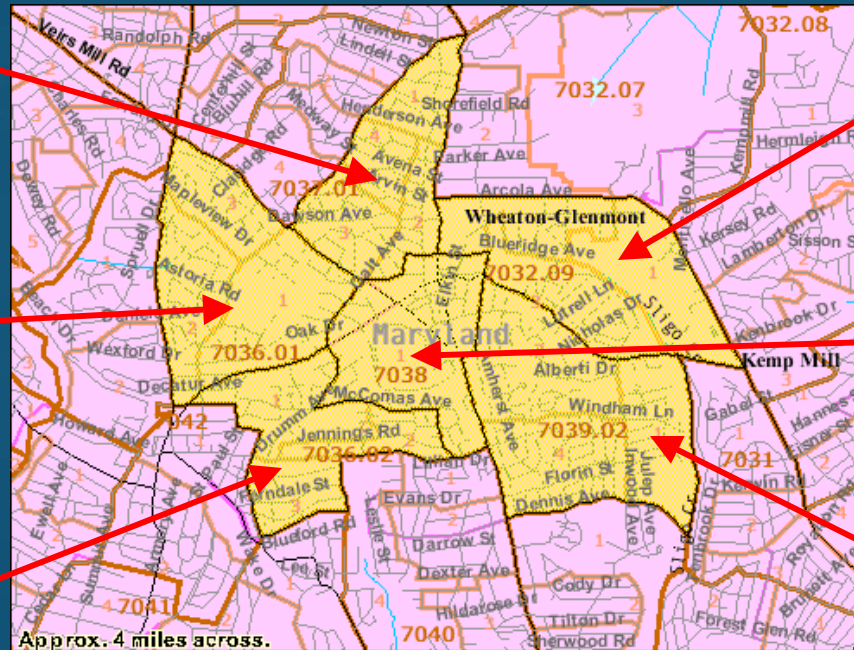
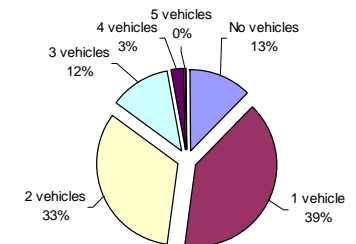
Census Tract 7032.09

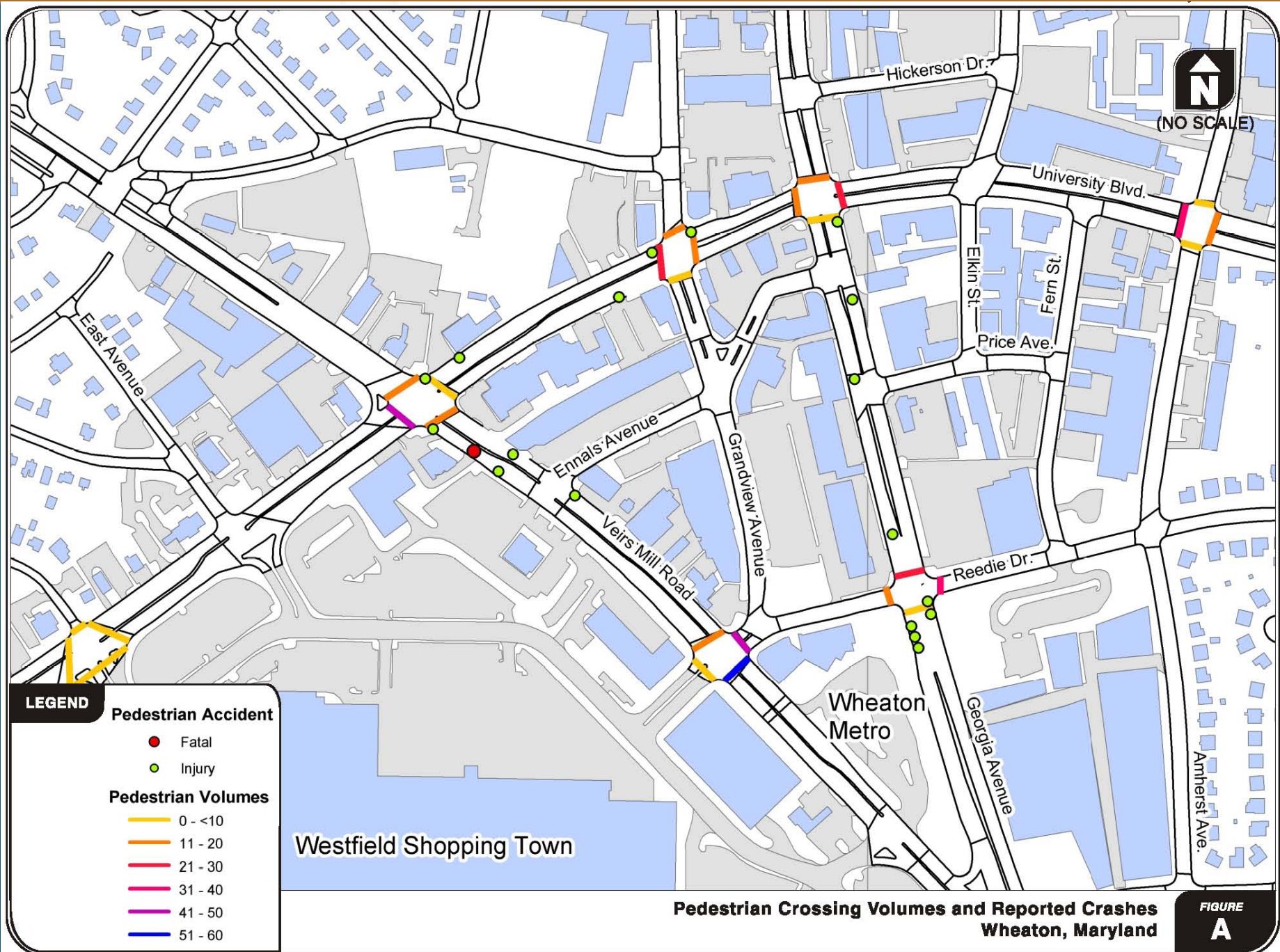


Census Tract 7038



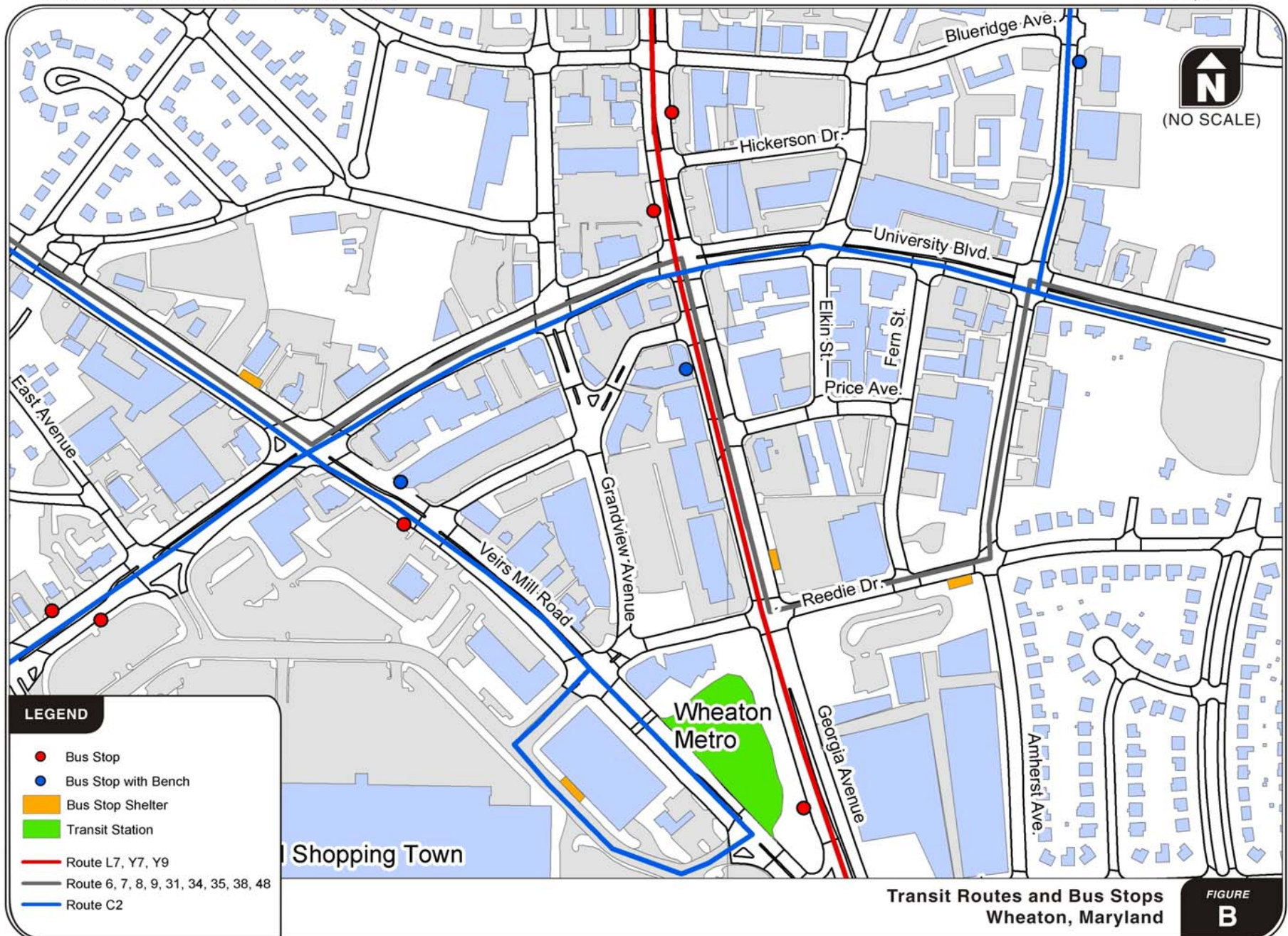
Census Tract 7039.02

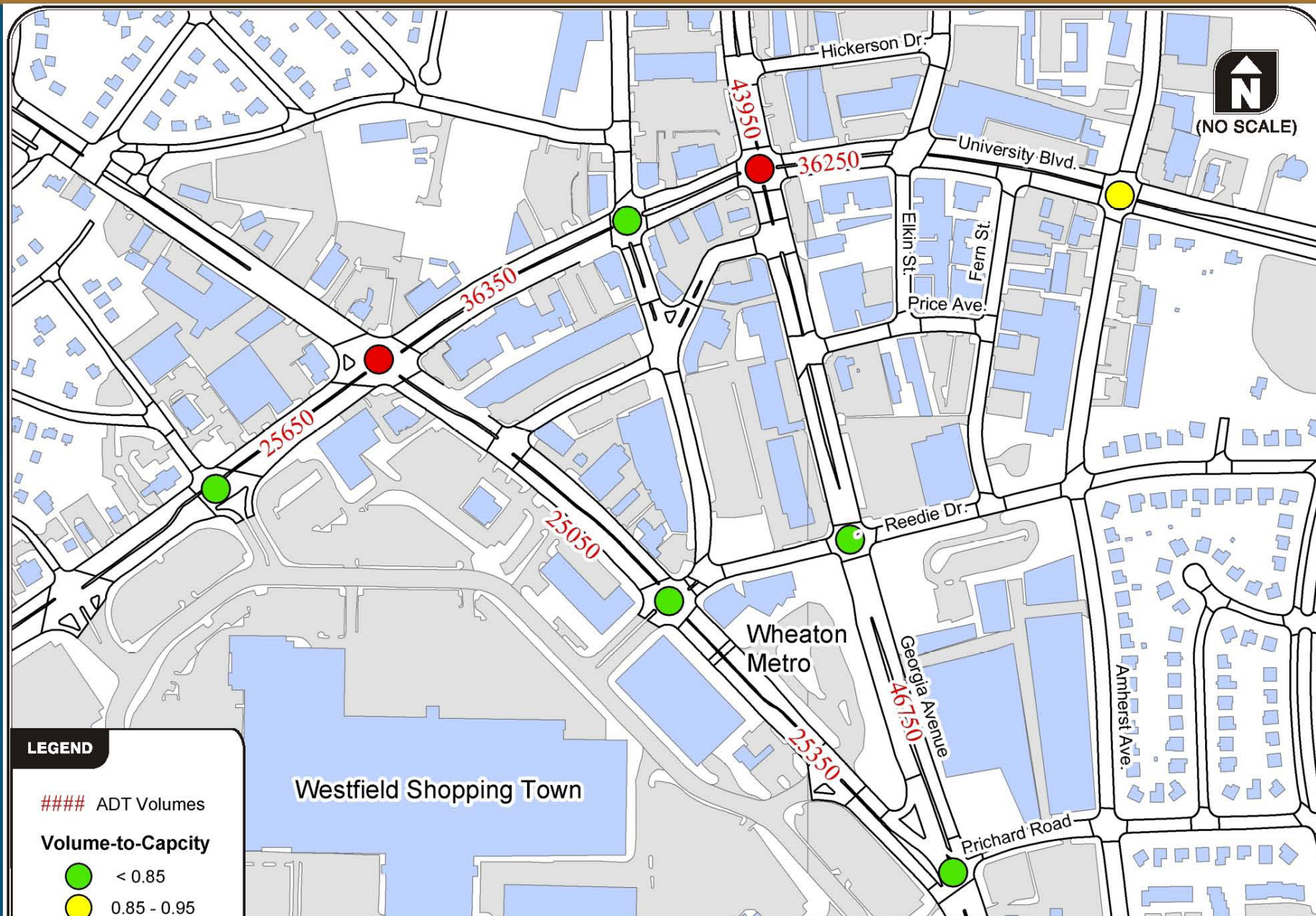




**Pedestrian Crossing Volumes and Reported Crashes
Wheaton, Maryland**

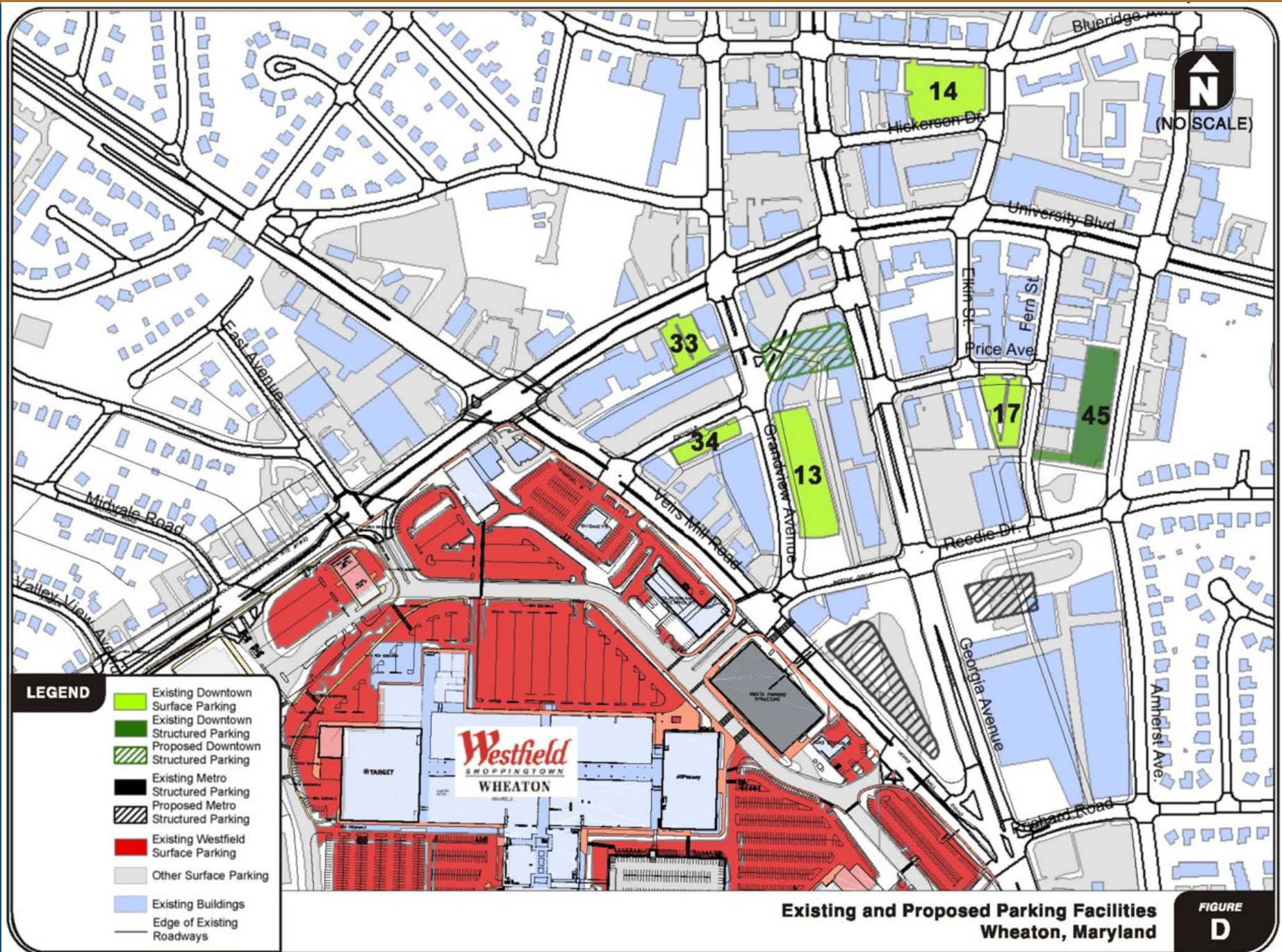
**FIGURE
A**





**Existing Condition Traffic Volumes and Intersection Operations
Wheaton, Maryland**

**FIGURE
C**



**Existing and Proposed Parking Facilities
Wheaton, Maryland**




**FIGURE
D**

Community Field Meeting

- **Teaching and Learning Session**
 - Community members are local transportation experts
 - Verify technical observations and perceptions
 - Test solution ideas
- **Team organization (3 routes/3 teams)**
 - Local County leaders
 - Transit provider
 - Property owners
 - Nearby Residents
 - Local and State Transportation Staff
 - Consultant Traffic engineer
 - Consultant Urban Designer
- **Start and End with Briefing Meeting**
 - Give Specific instructions and divide roles (recorders, measurers, photographers)
 - Gather and record key impressions at the end of the session



Goal 1: Support Logical Pathways, Key Connections and Safe Crossings

Element	Roadway	Section Location	Existing Conditions: Issues & Opportunities	Photo
1.3 <i>Internal site circulation/ Midblock Crossing</i>	Georgia Avenue	North of Reedie Drive (Safeway)	<ul style="list-style-type: none"> Undesignated pedestrian connection along the north side of Safeway through the parking lot to the bus shelter on Georgia Avenue Midblock crossing from Safeway to Marketplace Attractive landscaped medians provided on all approaches; nose is not wide enough to provide pedestrian refuge 	
				
1.4 <i>Crosswalk Maintenance</i>	Reedie Drive	At Fern Street	<ul style="list-style-type: none"> The Parking Garage on east side of Fern Street might be better utilized if the pedestrian connection was strengthened (lighting, sidewalk, street edge, etc.) Crossing treatments are provided but poorly maintained 	

Draft Pedestrian Safety Goals

- Support Logical Pathways, Connections & Pedestrian Crossing Safety
- Enhance Transit Stop Location & Amenity
- Improve Vehicle Safety & Wayfinding
- Strengthen the Walking Environment





Recommended Transportation Improvements
Wheaton, Maryland

FIGURE
1

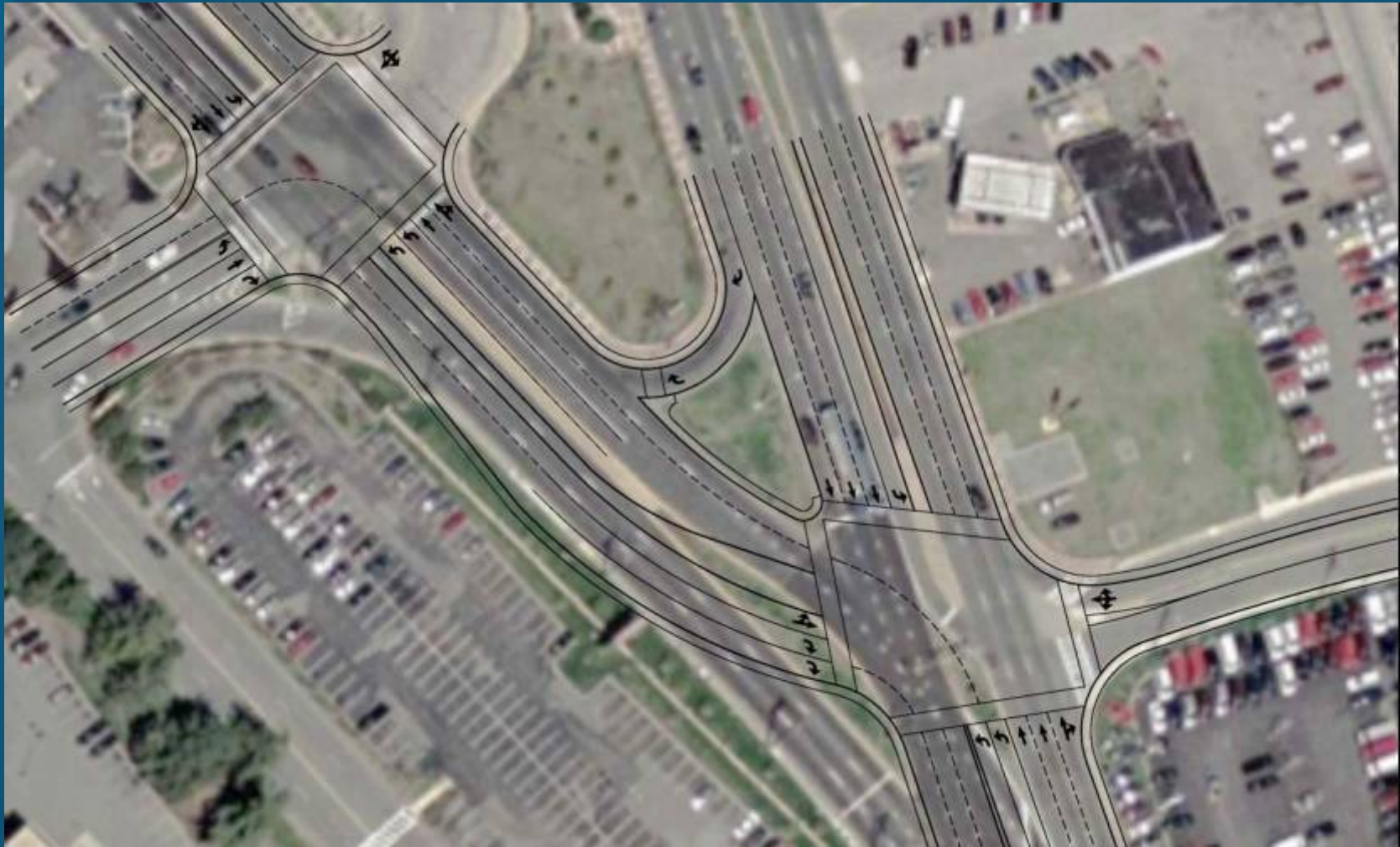
Support Logical Pathways & Connections



- Establish strong gateway into urban core
- Redesign to provide pedestrian crossing treatments at high demand locations



Create a Strong Gateway



Identify Generators



- Key link between transit and retail generators



Orient Site Design to Safe Crossing Locations



- Reorient pedestrian link between Wheaton Metro bus loop to Westfield Shoppingtown and Metro Parking
- Orient site access to intersections



Positive Pedestrian Guidance



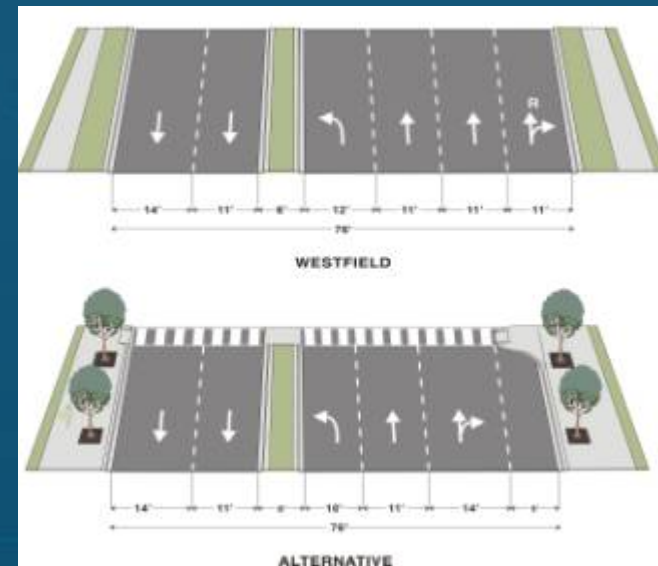
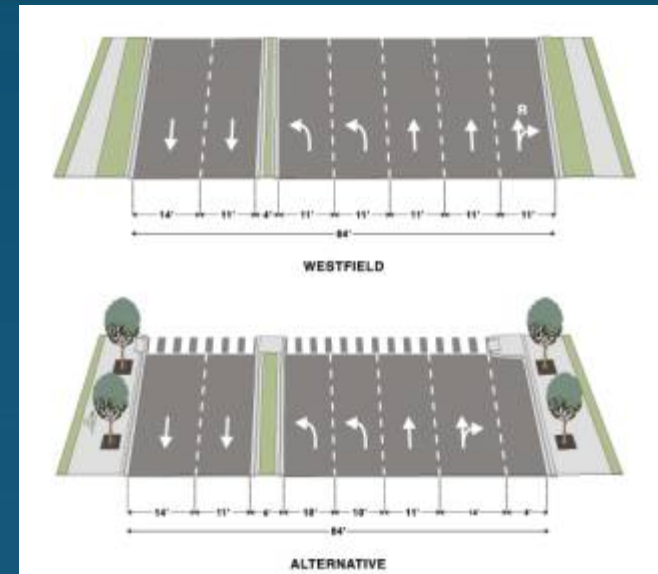
- Reduce pedestrian crossing distances (time spent in the travelway)
- Mark pedestrian crossings in intersections
- Channel vehicles to designated path



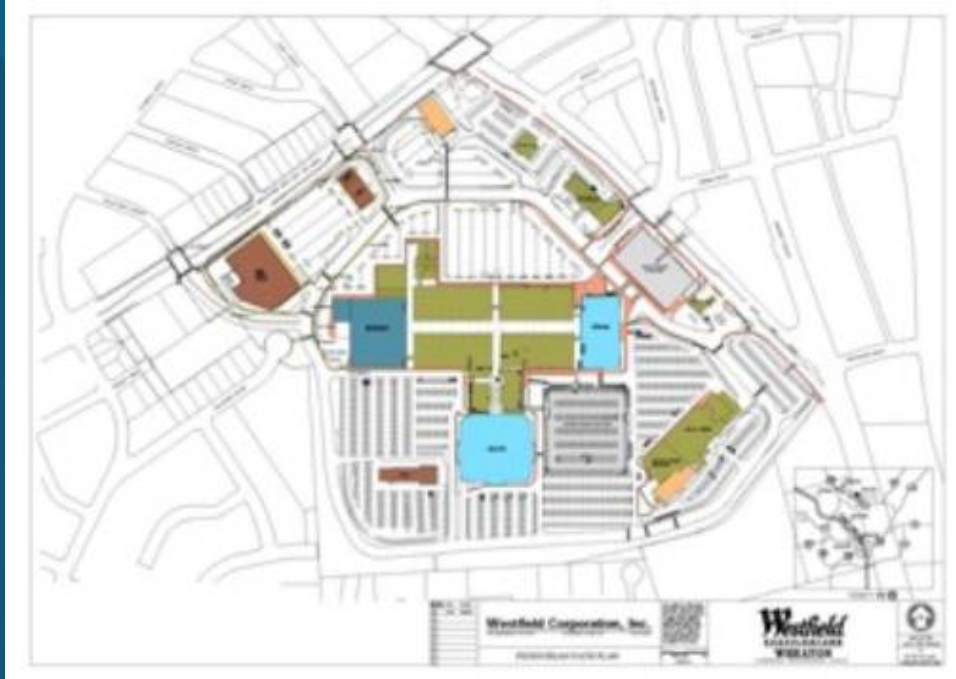
Reducing the Roadway Scale



- Use engineering technical tools to determine the best use of existing right of way



Creating Streets not Driveways



- Link pathways to destinations beyond the site
- Provide sidewalk and amenities
- Avoid creating parking barriers to points of entry



Intersections for Mixing Modes



- **Avoid free right turns and high speed turning movements**
- **Orientation and markings establish pedestrian priority**
- **Provide adequate corner space**

Information Enhanced Signal Hardware



- Improve pedestrian information with upgraded crossing hardware



Enhance Transit Stop Location & Amenity



- Locate bus stops adjacent to safe crossings



Bus Stops as Transit Customer Service Outlets



- Upgrade shelter areas with amenities to promote permanence and belonging



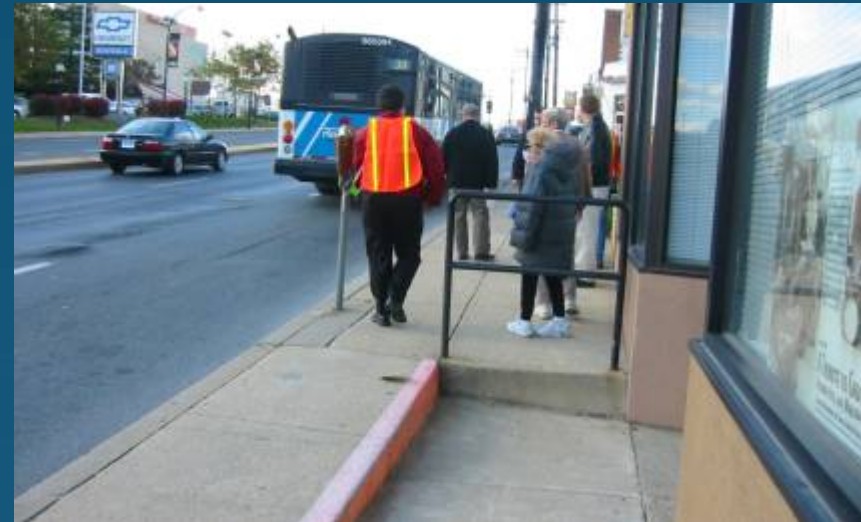
Bus Stops as Community Gathering Places



- Locate and provide shelters that add to the street architecture & aesthetic
- Provide system and area information



Strengthen the Walking Environment



- Ensure a clear pedestrian pathway ...especially for the visually and physically challenged



Pedestrian Enhancing Public Space



- Public spaces orient to the street
- Create gathering and sitting places at highly visible corners and edges

Distinguish Parking from the Pedestrian Realm



- Separate parking from the pedestrian realm
- Material changes identify user priority



Reclaim the Street Edge



- Reclaim building entry space for pedestrian pathways
- Include urban amenities

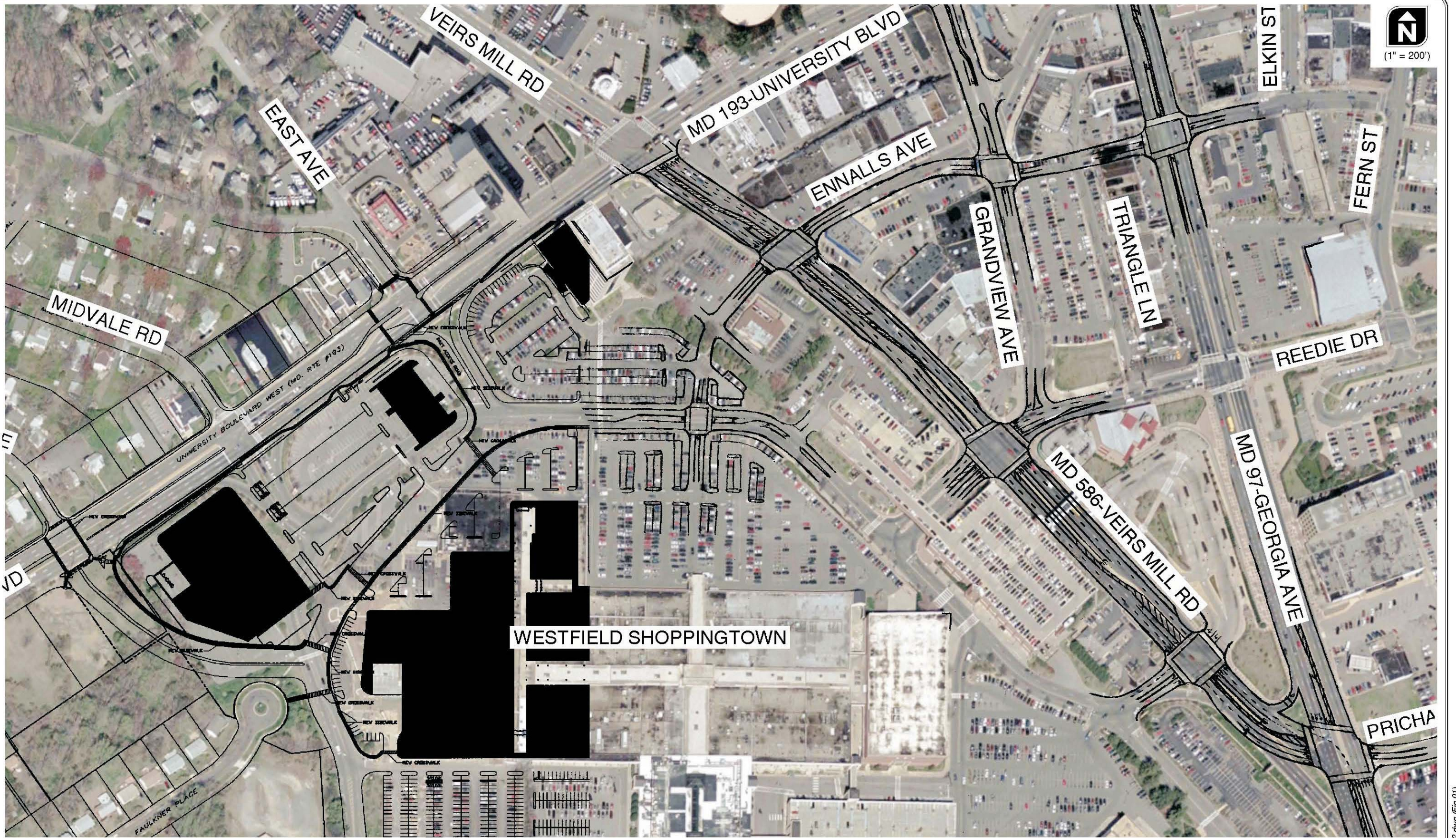


Building Boulevards from Arterials



- Create street edges with doors, windows and people on the street
- Promote vertical mixed use





CONCEPTUAL ROADWAY IMPROVEMENTS
VEIRS MILL ROAD/ GEORGIA AVENUE OPTION "B"
WHEATON, MARYLAND